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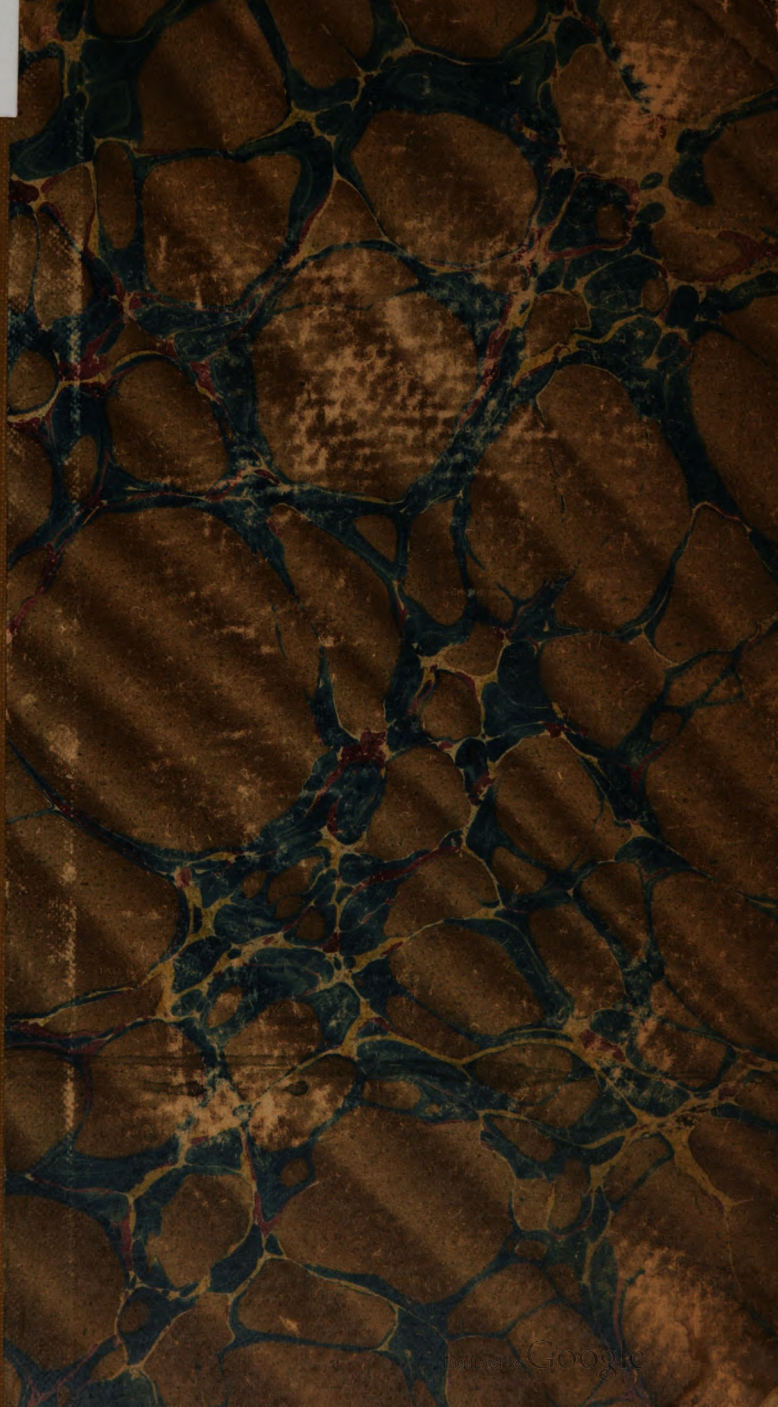
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**A Syllabus of
Psychology**

**By H. Heath
Bawden.**

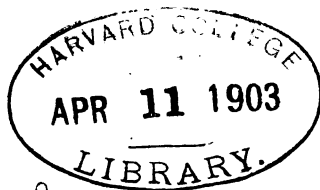
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A
SYLLABUS
OF
PSYCHOLOGY

BY
H. HEATH BAWDEN

Vassar College
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PREFACE.

Psychology has two aspects. It may be regarded as an introduction to philosophy or as an introduction to science. Until the middle of the nineteenth century psychology or Mental Science was simply a study preliminary to the taking up of the larger problems of philosophy. Today psychology has been put upon an experimental basis, and thus takes its place along with other natural sciences. But psychology stands on a slightly different plane from the rest of the sciences in that it deals with problems which underlie all the sciences, and in this aspect still forms a natural introduction to the study of ultimate problems. Psychology, in a sense, is the place where philosophy and science come together. It is dependent upon science for its data and problems, and upon philosophy for the criticism of its methods. In this study of psychology the aim is to utilize the results of the modern experimental methods, but keeping in mind throughout the wider bearing of these psychological investigations upon the ultimate problems of logic, ethics, metaphysics and education.

The author of this Syllabus is a firm believer in a functional, based upon a genetic psychology. The plan of treatment here followed is that of expanding those parts of the Syllabus which are more or less peculiar to the author's point of view, leaving other parts which differ in no essential respect from the treatment by other writers, in the form of mere topical headings. The experiments suggested are such only as are possible without the appliances of a laboratory. The author wishes here to express his indebtedness to Professor Clarence L. Herrick and to Professor John Dewey for much of what he understands by the dynamic and organic point of view in psychology.

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Romanes, Mental Evolution in Animals.
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INTRODUCTION.

CHAPTER I.

THE MEANING AND PROBLEM OF PSYCHOLOGY.

The answer to the question, What are we going to study? is found in considering the definition, aim and scope of psychology. The answer to the question, How shall we study it? is found in the consideration of the postulates, data and methods of psychology. The answer to the question, Why should we study it? is found in the consideration of the history and value of psychology.

1. *Definition* of psychology.

(1) Inadequate definitions: (a) "science of the soul" (e. g., Porter), (b) "science of states of consciousness as such" (e. g., Ladd), (c) "science of immediate experience" (e. g., Wundt).

(2) Provisional definition: psychology is the science of experience as process. Stout defines psychology as "the positive science of mental process" (*Analytic Psychol.*, I, 1; cf. his *Manual*, 1-4). Titchener says "psychology deals always with processes, and never with things" (p. 5).

2. *Aim* of psychology: to understand the facts and laws of the growth of experience.

3. *Scope* of psychology.

Is psychology a department of philosophy, a branch of biology, or a separate science? One or another of these views is held by different writers on psychology. Historically, psychology was first conceived as a department of philosophy. In support of this view it may be shown that

all the sciences are branches of philosophy in one sense. The question is, Is psychology any more philosophical than the other sciences?

The second view, that psychology is simply a branch of biology, identifies psychology with physiology: cf. Carpenter's book entitled "Mental Physiology." The importance of physiological considerations in the understanding of mental life cannot be overestimated, but they need not lead to the identification of mind and matter—the mistake of materialism.

The third view, properly understood, is the true one. Psychology is distinguishable from philosophy, on the one hand, and from the other sciences, on the other hand. Yet psychology, at the same time, is dependent at every point both upon philosophy and these other sciences. Philosophy and the several sciences are interdependent and presuppose one another as much as the different parts of an organism presuppose and are necessary to one another.

The main difference between psychology and physical science is that it is interested rather in the *process* than in the content of our experience. As Professor Stout says, it "does not directly and primarily aim at increasing our knowledge of the material world," but "the cognitive process itself is an object of psychology" (Manual, 4).

Psychology differs from logic, ethics, metaphysics and epistemology, mainly in the degree of detail with which it considers ultimate problems. A psychology carried out in all its implications would be a complete philosophy.

4. The *Postulates* of Psychology.

There are certain philosophical presuppositions which underlie psychology, presuppositions concerning the na-

ture of reality and of knowledge. A complete investigation of these would lead us into philosophy. In psychology the existence of reality and the validity of knowledge are taken for granted.

Besides these philosophical presuppositions there are certain biological assumptions as to the nature of the psychophysical organism, especially the relation between the organism and consciousness. Consciousness is the functioning of the organism under certain conditions of organic tension. The study of psychology illustrates this at every turn, but the complete justification of this principle would lead us into biological as well as philosophical problems.

In addition to the philosophical and biological, there are sociological implications in psychology, the most important of which is the social character of consciousness. An isolated consciousness is a self-contradiction: it is no consciousness at all. Robinson Crusoe did not get away from society when he was wrecked on a desert island: his consciousness was already socialized.

5. The *Data* of Psychology.

The data of psychology are the processes of change in the growth of experience. Any experience may become a datum of psychology if and in so far as it has undergone reconstruction in consciousness, or is undergoing or is capable of undergoing such reconstruction. When taken in the process of undergoing this reconstruction, such data are called immediate; when regarded simply as having undergone or as capable of undergoing reconstruction, they are called mediate data. The data derived from the introspection of the adult human being would be of the

first sort. The data derived from external observation of conscious organisms would be of the second sort.

6. *Methods of Psychology.*

Introspection was the first historically and it is the most fundamental method of psychology. All other methods must be brought to the test of introspection. The experimental method in psychology means simply controlled or experimental introspection.

The modern differs from the older psychology also in being genetic rather than merely analytic. The analytic psychology takes a cross section of the experience and shows you by analysis of what elements or factors it is composed. The genetic method makes a longitudinal section of experience, and shows the order of development or growth of one experience out of another.

Hence modern psychology is functional rather than structural in its standpoint. It begins in its study of mental life, not with abstract sensations and affections, but with the concrete activity-experience, and shows the functional parts which feeling and thinking play within the life of action. Thus the functional goes back to the genetic psychology for its principles of explanation. Experience is not made up of parts mechanically put together, but of activities organically interrelated.

The functional psychology of experience answers the question as to how it works. How does it operate? The genetic psychology attempts to answer the question as to how it grows. What is the genesis of experience? Just as we cannot understand the full functional significance of an organ except by reference to its evolutionary homologues, so we cannot understand the full significance of a

process in consciousness apart from its psychogenetic sources.

7. The *History* of Psychology.

Primitive peoples and children regard any object as animate and conscious, and, on the other hand, they speak of the mind or soul just as if it were another physical object or thing. The Greek philosophers identified the soul (or spirit or mind) with fire or breath or motion. Aristotle said that the soul is the form or entelechy of the body. With the progress of reflective thought the soul became conceived less and less in concrete material terms and more and more in abstract terms. When we come to Descartes we find that he holds that the soul and the body belong to distinct orders of being, the material and the immaterial realms.

The introspective method was announced by Augustine in mediaeval, and by Descartes in modern times, but was elaborated chiefly by the English psychological philosophers—Hobbes, Locke and Hume. England is the birthplace of introspective and analytic psychology, and the fact is to be correlated with this that it was in England that the individual first came to his rights politically and socially. English psychology is essentially individual psychology.

Germany is the birthplace of experimental and of physiological psychology, as France is of social psychology. Animal or comparative, and folk psychology originated partly in Germany and partly in England and France.

Thus the evolution of the psychical (and of psychology, the science of the psychical), has its place in the general evolution of human science and individual freedom.

8. The *Value* of Psychology.

The value of psychology is best seen in the consideration of the significance of the psychical individual in history. In the stationary civilizations of the world the individual is lost in the institution. In the progressive civilizations it is in and through the individual that the social advance is made. Psychology studies the process of experience in and through which the individual sums up and transmits the life of society.

The educational worth of psychology is seen in its value as information, giving knowledge of the process of experience, and in its disciplinary value, giving a principle of control for the regulation of experience. Its practical value to the teacher, the lawyer, the physician, the business man, the minister, the detective, and, in general, to any student of human nature, is obvious. Its general culture value lies in the fact that it is related to every branch of philosophy and science, and to art, literature and music, as well as to practical life.

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- Ladd, Outlines of Descriptive Psychology, Intro.
- Calkins, Introduction to Psychology, Chaps. I and XXVIII.
- Baldwin, The Story of the Mind, Chaps. I and II.
- Höfdding, Outlines of Psychology, Chap. I.

CHAPTER II.

THE PSYCHOPHYSICAL ORGANISM.

In order to understand consciousness we must know something of the organism which is conscious. The first question to arise is

1. *What is an organism?*

An organism differs from a machine in two respects: (1) in its power of self reproduction, and (2) in its circular or spiral process of waste and repair. How does a plant or an animal differ from a stone or a star? We say that the former are organisms and have life. What is life? Is life anything but the process of adaptation, of growth? Compare a bean with a pebble, or a living tree with the decaying log.

2. *What is the relation between consciousness and organism?*

All organisms are not conscious or, at least, they are not conscious all the time. All life is not conscious life. The interesting question arises whether the first organism was conscious? Are plants conscious? Are all animal organisms conscious? What is the criterion for the presence of consciousness in an organism? Under what conditions does consciousness emerge in our experience?

There are three theories as to the relation between consciousness and the organism: (1) The theory which restricts the psychical to the conscious. The defect of this theory is that it leaves unaccounted for a great part of our experience which obviously has a psychical origin e. g., habits and automatic acts. (2) The theory of unconscious mental states. The limitation of this theory lies in calling

anything which is unconscious, mental. (3) The theory of the mechanisation of conscious acts. This the theory defended here.

In interpreting the unconscious we must begin with a study of an organism which clearly is conscious. We must begin with a psychophysical organism. Man is such a conscious organism. Yet even man is not conscious all the time. Fully nine-tenths of the activities of the human body are unconscious or only semiconscious.

Experiment 1:—Watch your neighbor's acts for the next ten minutes and note down as many of them as possible. Then ask him of how many he was conscious at the time of their performance. (Of course, the observation must be made when the other person is not expecting it).

The unconscious background of our experience can only be explained by an understanding of the genesis and growth of consciousness. The unconscious act is an act which, originally conscious, has been rendered automatic by frequent repetition and the mechanisation of the attentional process. This process of mechanisation may be seen in the formation of all habits which, when they become deeply rooted and transmitted to offspring, are called instincts. The process of walking or of talking was once even painfully conscious, but with the adult it is almost if not quite automatic. Little mannerisms, such as balancing on one foot or fingering one's watch-chain, soon become unconscious motor automatisms.

The conscious would thus be the focus of experience while the unconscious would be the marginal part or context. If this view is correct, one naturally wonders whether the human soul has resulted from a compounding of minds in some such fashion as his body is a compounding of cells.

And the further query arises as to whether there may not be a social consciousness corresponding to that organic whole which we call society just as there is an individual consciousness corresponding to that organization of cells which we call the human body.

3. *The Place of the Nervous System in the Organism.*

Consciousness is most directly connected with the nervous system, but is indirectly related to the entire organism. More than that. Our experience is connected indirectly with the movements of the remotest atom in the universe. What we call a single organism is simply the whole universe coming to a focus in a finite centre. Through each such centre the forces of the universe surge to and fro for weal or woe. At each step we take, for example, it is true, on the one hand, that we resist a world with the pressure of the foot, while on the other hand, the spring in our step is just the great universe giving us a push. In the explanation of life and of consciousness, therefore, we are obliged ultimately to go beyond the nervous system, and even beyond the organism, in order to relate them with the cosmic energies which are the source of all human as well as of all other natural life.

The nervous system is simply an equating or coordinating mechanism for effecting the adaptations and adjustments necessary to life and growth. The nervous system from the standpoint of the environment is an instrument for the mediation of the stimuli which impinge on the organism from without. From the standpoint of the organism itself the nervous system is an organ of control: (1) manipulating the environment to its needs, and (2) ad-

justing the various organs to one another within the organism.

In performing this equating function, it may be said that the peripheral nervous system serves to report the impressions made upon the senses by the environment and to express the activities of the organism. The nervous system balances or coordinates the special activities of stimulation and response. These processes of stimulation are interdependent. The process of stimulation always involves the active selection of the stimulus by the organism. A mere shock may be an excitant but it is not properly called a stimulus, which is always of such a nature as to call out some definite response. The factor of the selection of the stimulus is seen in the accomodation of the optical apparatus in vision, turning of the head in listening, sniffing in smelling, etc. On the other hand, the process of response is always determined and controlled ultimately with reference to the process of stimulation. We unconsciously react in such ways as to reinstate the conditions favorable to the preservation of life and to progress in growth.

4. *The Organic Circuit.*

The total process of adaptation, including these two processes of stimulation and response, is called the organic circuit. By this is meant any given experience which may be treated as a whole, including the conditions which make it possible, the data of consciousness which form its content, and the results which arise from it.

Take any simple performance, such as an ear-hand coordination. Let us suppose that at the sound of a click you are to press an electric button. When you have ear

hearing then immediately you are to have finger pressing. In such an experience it will be noticed that both the ear and the hand are held in readiness, the one to hear the sound of the click, the other for the pressing of the button. The ear hears with reference to what the hand is going to do, and the hand presses in response to the information received through the ear.

Thus the processes of stimulation and response which take place through the sense organs and the muscles are reciprocally related. The muscles are necessary for the selection of the stimulus, as well as the stimulus through the sense organs, for the calling out of the response.

Experiment 2—Seek as nearly perfect physical repose as possible, in a noiseless and darkened place and when not fatigued. Shut the eyes, and assume a position of muscular relaxation. Allow the mental process to on as far as possible without voluntarily contributing anything to it. Let the stream of feelings and ideas have free unimpeded course. Can you attain a state in which you take no part except as observer of what goes on? What is the meaning of this?

5. *The Structure of the Nervous System.* See references.

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- Stout, Manual of Psychology, Intro., Chap. III.
Halleck, Psychology and Psychic Culture, Chap. I.
James, Psychology: Briefer Course, Chaps. VIII and IX.
Baldwin, Handbook of Psychology, II, Chaps. I and II.
Calkins, Intro. to Psychology, Appendix, Sec. I.

PART I. ACTION.

CHAPTER III. THE GENERAL ANALYSIS OF EXPERIENCE.

I. *Experience.*

In psychology we study ourselves in such activities as doing, trying, failing, succeeding, seeking, avoiding; feeling, suffering, enjoying, loving, hating, fearing, hoping; seeing, hearing, smelling, tasting, touching; thinking, knowing, judging, inferring, reasoning. All such processes taken together make up what we call experience.

These processes are bound together into an organic whole. One never finds himself simply seeing or smelling or feeling or thinking. Every experience is bound up with a mass or tangle of other experiences. I touch, taste, smell, and see an apple, and, though I usually conceive the apple in visual terms, as form and color, yet all these other factors so contribute to the whole that the absence of any one of them would make a difference in the total perception of the object.

My experience in the broadest sense embraces what I-call-myself-and-all-that-I-know-and-feel-and-do. All the different processes which are enumerated above as so many distinct acts, in our experience are found running into one another in an apparently inextricable tangle so that often we cannot tell where one stops and another begins. Psychology is the attempt to unravel this tangle. Its aim may be expressed in the words of Socrates: Know Thyself.

We begin with our experience as it actually is, with all its confusion of impulses and motives and wishes and thoughts and ambitions and resolutions and choices and

acts, and our aim is to see if there is any order in all this chaos, to find if possible the laws which run through all these various processes binding them into a unity; to analyze experience into its elements or factors, on the one hand, and to discover the laws of its growth, on the other.

2. *Consciousness.*

It has already been said that nine-tenths of the acts which we perform as living organisms are unconscious, yet they constitute an indispensable part of our total experience. If this is true, then the question arises, When and under what conditions do such acts become conscious, or if they were once conscious and have become unconscious, when and under what conditions did they become unconscious? This is distinctively the problem of psychology.

In order to understand conscious experience it must be viewed in the light of its relations to that mysterious background of consciousness which is called the subliminal self. Experience is all that one is and does, and one is and does many things of which he is not conscious. Consciousness is always relative to the unconscious.

The reply that we have given to this question as to the relation between the conscious and the unconscious in our experience is that the unconscious results from the mechanisation of the conscious act. The further question arises here as to why consciousness keeps on developing even after an animal has been furnished thereby with a relatively complete outfit of instincts and habits. Why is not the immediate or direct process of instinct sufficient? What keeps up the evolution of consciousness either in the individual or in the race? To answer this question

we must consider the mutual relations of the fundamental aspects of experience—action, feeling, and thinking.

3. *Action or Doing.*

Experience is fundamentally an activity. The organism is a machine for doing work. When the activity proceeds smoothly it goes on unconsciously or automatically. It becomes conscious activity when it is interrupted or hindered in its onward movement. Take the act of walking to the post-office. This is quite automatic if the route is familiar. But if the route is unfamiliar or the path blocked or if this is your first walk after a prolonged illness, then the walking becomes a distinctly conscious activity.

We are primarily organized capacities for action. Conduct is more than three-fourths of life: it is the whole of life. Experience is wholly an act or activity, a doing something; feeling and thinking are simply specific ways of doing, in which the activity instead of being overt and obvious is organic and cerebral and thus obscured. You are doing something just as much when you think a thought as when you throw a ball. The only difference is that the one is apparent in external muscular contractions, while the other is represented chiefly by hidden neural coordinations.

As has been said, the greater part of our activities are unconscious. You wake up in the stillness of the night and hear your own heart throbbing, five-eighths of a pound of blood in each pulsation, seventy-two pulsations in a minute, all the blood passing through the heart every half-minute, twenty-seven hundred pounds per hour, thirty-two and four-tenths tons per day. This is only a sugges-

tion of what the organism accomplishes merely as a machine, quite apart from the consciousness of the individual.

But certain of our acts are conscious. These take the form of feeling or thinking. But the feeling and the thinking always arise out of and for the sake of the doing. For example, if I am in haste to post a letter, a barricaded street will cause me some anxiety (disagreeable feeling) and perhaps stimulate some thinking in order to surmount the obstacle: here the feeling and the thinking are instrumental to the acting—which is to get to the office in time to post the letter.

4. *Feeling and Thinking.*

Psychology is thus the science of feeling and thinking because it is the science of doing. Our feelings and thoughts are ultimately for the sake of our acts: they arise within the general activity experience as special modes of that activity. Instead of Thinking, Feeling *and* Doing, we should speak of Doing (Feeling + Thinking). Here is the significance also of defining psychology as the science of the *process* of experience—since it deals with the process by which conscious feelings and ideas emerge within the life of action.

Our feelings we inherit largely from our animal ancestors, for whom they served the purpose of danger signals or signs of safety. For example, fear, the defensive emotion, was developed in connection with approaching danger. Anger, the offensive emotion, on the other hand, was developed in connection with the attempt to resist an enemy. So also, our thoughts or ideas are always worked out in relation to some problem which arises when our

activity is obstructed. For example take the case of a student trying to solve a problem in algebra.

5. *The Growth of Consciousness.*

The problem of psychology, then, is to trace the conditions and stages of the emergence of consciousness within experience. The aim is to show how previously unconscious activities come into the focus of consciousness and how, under other conditions, they pass out of the focus of clear consciousness through successive stages of decreasingly distinct consciousness until they become unconscious again (i. e., automatic).

The growth of consciousness is best studied in its evolution in the race. The development of consciousness in the child is a greatly abbreviated recapitulation of this race evolution. Inasmuch as the greater part of man's mental life is found in this unconscious background of automatic activities, it is only possible rightly to interpret his conscious mental life by interpreting it in terms of in terms of this unconscious back ground, out of which it emerges and into which it is destined to return, though in a modified and reconstructed form.

In the following pages, therefore, we shall proceed to the consideration of instinct, impulse and habit and their relation to consciousness and attention: this will serve to show how in general the conscious are related to the unconscious modes of experience. This constitutes Part I. In Parts II and III we will study more specifically the two main forms which conscious activity takes, under the heads of Feeling and Thinking.

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CHAPTER IV. INSTINCT.

1. *The Chief Characteristics of the Animal Consciousness.*

We are psychophysical organisms. We are related physically to the lower animal and, according to the theory of evolution, our physical ancestry can be traced back to the simplest forms of life which are mere specks of protoplasm. Now if this is true of our bodies it is also true of our minds, since consciousness is inseparable from the organism which is its physical basis. If, then, human consciousness, like the human organism, has evolved out of an animal consciousness, we may well first inquire how the animal differs from the human type of consciousness, and what is the nature of that large and important part of our experience which we receive as an heritage from our animal ancestry.

The chief characteristics of the animal consciousness are : (1) Its immediacy. It is characterized by more direct activity, i. e., by comparatively less feeling and thinking, than the human consciousness. (2) Its impulsiveness. Acts are relatively uncontrolled. (3) Its predominantly affective nature. While there is absolutely less feeling and thinking than action, there is relatively more feeling than thinking. (4) Its instinctive character. Acquired reactions are soon mechanised. What thinking there is,

is sporadic and vague, and there is a notable absence of memory and free ideas.

Stated in other words, this means that the animal consciousness is a less mediated type of consciousness. It is made up more largely of unreflective activity (doing) than of reflective activity (doing which has been mediated by feeling and thinking).

2. *Tropisms and Reflex Action.*

A tropism is an adaptation, either in plant or animal organisms, in which there is no clearly differentiated nervous system, and from which all consciousness has vanished because of the uniformly mechanical nature of the coordination. An illustration would be the curling of the tendril of the vine about its support, the turning of the hydropolyp to the light. All growth is rhythmic and all rhythmic movements tend to become automatic and therefore unconscious.

When there is evidence of the use of a clearly differentiated nervous system in mediating the adaptation, we get reflex action, as seen, for example, in the behaviour of the brainless frog. True reflexes are wholly subconscious, e. g., secretion of the glands. But certain other reflexes are semiconscious, that is sometimes or always partially conscious, e. g., respiration, the heartbeat, winking.

A reflex action differs from an instinct only in degree of complexity. When we speak of the reaction of a single organ we usually call it a reflex; when we speak of the reaction of a group of organs or of the organism as a whole we call it an instinct. All instinctive activity involves reflex action. Instinct is sometimes defined as

compound reflex action. Instincts as a rule are not conscious in their operation. But in case one instinct or group of instincts comes into conflict with another, consciousness is liable to emerge at the point of stress between the two conflicting tendencies.

3. *Theory of Instinct.*

There are two theories as to the origin of instinct : (1) The theory of natural selection (or the unconscious origin of instincts). On this theory, instincts precede consciousness, and those chance reactions get stamped in which happen to be first, which are easy to perform, and which happen to be useful for the preservation of the individual or of the species. This is the view of Darwin, Weismann, Spencer, Romanes. (2) The theory of lapsed intelligence (or the conscious origin of instincts). On this theory, consciousness precedes instinct. Instincts are coordinations which, originally conscious, have become mechanised through repetition and uniformity of conditions, and then inherited. Instincts are thus simply race habits. This view is held by Lewes, Eimer, Cope, Wundt.

4. *The Nature of Instinct.*

The following important characteristics of instinct are to be noted :

(1) An instinct is always common to a group of animals (usually the species). Instinctive acts are typical, i. e., common, acts.

(2) Instincts are subservient to the welfare of the organism, not always of the individual organism, but of the species. That is, instincts are directed to a definite biological end, though, after the instinct has been once

thoroughly established, there is no longer any consciousness of that end.

(3) Hence instinct is relatively blind and irresistible ; blind, because unconscious ; irresistible, because inherited and congenital. But this is not inconsistent with their being purposeful. Instinct has been defined as an exhibition of intelligence *in* but not *of* the being to which the instinct belongs.

(4) Instinctive reactions may be serially complex but they never exhibit the intricacy found in human inference and reasoning.

(5) Under special training, animals will react with considerable delicacy, but as a rule instinctive reactions are vague responses to total situations.

(6) Some instincts are connate ; others are deferred ; still others are transitory.

(7) No instincts are rigidly fixed or immutable, but are plastic and capable of modification. All instincts are in the process either of becoming rendered more definite and certain or of being broken up and undergoing disintegration.

5. *Classification of Instincts.*

Instincts may be divided into two classes according as they are connected with the preservation of the individual or with the preservation of the race. The instincts of self preservation are in general the nutritive instincts : (1) Instincts of infancy, e. g., sucking, biting, crying, smiling, grasping, etc.; (2) Organic reflexes; e. g., breathing, heart-beat, action of the vital organs, (3) The acquisitive or appropriative instinct, e. g., the hunting, exploring, roving, inventive, imitative, constructive instincts.

The instincts which tend toward the preservation of the race are the sexual and social instincts. These include : (1) The mating instincts, (2) The instincts connected with emulation and rivalry, (3) Protective instincts, (4) Natural language, (5) Gregariousness.

6. *Instinct and Reason.*

Instinct and reason are divergent developments out of a more primitive and less organized mode of experience which is best described as impulse. Both instinct and reason are modifications of impulse, but in opposite directions. An instinct is an impulse which has been hardened into a fixed and therefore unconscious mode of behaviour. Reason is impulse which has been rendered more and more plastic and pliable and therefore more and more conscious. Instincts represent the static, the constant, the fixed type of experience. Reason represents the dynamic, the variable, the growing type of experience.

In the case of every organism there are two possibilities. Either the life of the organism may become bound up with a single or with a few reactions which become mechanical and automatic, the consciousness of the animal being thus greatly narrowed, but in compensation being rendered safe by the mechanical certainty of the reactions within its restricted environment. Or the organism may develop the ability to adapt itself in a wider and more changing environment, with less immediate certainty but with greater range of possible adjustment. The former line of development gives us the typical instinctive life of the invertebrate ; the latter gives us reason as it has been developed chiefly in the vertebrate line.

It is sometimes said that psychology labors under a

difficulty in the lack of data, which the other sciences do not feel. It is remarked that psychology does not have, as does geology for example, a fossilized past in the rocks which presents an inexhaustible source of material for study. But this is an error. Psychology has just such an inexhaustible record constantly at hand ready to be interpreted, in that great background of animal impulses out of which, or rather within which, reason is so slowly emerging. And just as we cannot properly comprehend the geological formations surrounding us until we relate our own era to the aeons of the past, so we cannot comprehend reason as we find it in the civilized adult human being until we see its relations to that instinctive past out of which it has emerged and is emerging.

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CHAPTER V. IMPULSE.

1. *Impulse and Instinct.*

Impulse represents either an inherited capacity which is only partially mechanised, or a definite congenital mode of behaviour, an instinct, which is breaking up or disintegrating under the stress of changing conditions. Impulse exhibits what Morgan has called "the relative instability of a need or want." All appetites, cravings, desires, aversions, all the more or less vague and blind organic demands, are impulsive.

Impulses have their origin in acts which have been proved to be necessary in the life of the race and have become so organized into the structure of the individual that they assert themselves spontaneously as appetites and aversions, yet are capable of modification by the experiences of the individual. That is, they are strongly propulsive and dynamogenic, yet have not become mechanised in the form of fixed habits nor inherited in the form of congenitally definite instincts.

Many impulses represent instincts broken up and brought to consciousness by reason of the fact that they fail to meet the requirements of some new type of situation. That is, impulse represents the point at which either new instincts (habits) are being built up or at which old ones are being broken down. Impulses are always vague at the start. But they either get stamped in as fixed modes of reaction, and are then called instincts, or they undergo continuous modification and are then called rational acts.

2. *Impulse and Consciousness.*

Impulses come to consciousness first vaguely and in an uncontrolled way as feelings, then later more definitely and in a more controlled way as sensations, as cognition. The impulsive consciousness is predominantly a feeling consciousness. We contrast a creature of impulse with a rational being and look upon the feelings as the alogical forces of the soul. An outburst of impulsive action is accompanied, as Baldwin says, by a run-away-horse feeling. Only in the cognitive stage does the run-away-horse feeling give place to that of a steed well under rein. Just as feeling and thinking develop within doing, so thinking, in a sense, develops within feeling, in order to organize it and control it.

3. *Impulse and Habit.*

Habit and consciousness are growths in opposite directions out of impulse. An impulse stamped in forms a habit. A habit inherited is an instinct. An impulse meditated or transformed gives rise to conscious reason. Hence the longer the period of infancy, i. e., the longer the stage in which the experience remains in the form of vague impulses, undergoing reconstruction, the greater the opportunity for the growth of consciousness and of reason. The importance of impulse is in direct ratio to the length of the period of infancy of the animal. This is the meaning of infancy and youth everywhere. It is the period of plasticity and growth, the period when, if at any time, the acquirement of new mental characters or traits begins. Man inherits a great mass of impulses from his animal ancestors, and this interconnected system of im-

pulses, because so flexible and as yet unfixd, is what makes man preeminently the educable animal.

The aim of human education is to set up rational habits in place of the instinctive sort of habits which are found in the animal or in the untrained human child. Hence the significance of consciousness, which attempts to meditate these impulses and in place of blind instincts to set up conscious ideals. These ideals when they become operative as standards of conduct are transformed into rational laws and principles—which, in the last analysis, are only reflective habits as contrasted with the unreflective instincts of animals. The chief characteristic of the development in the direction of consciousness is the indefinitely increased plasticity, mobility, flexibility, which is introduced into what would otherwise be relatively fixed modes of action. And when this increased flexibility is at the same time mediated or brought under control, the possibility of definiteness and accuracy surpasses even that of instinct. Here lies the significance of the fact that whereas instinct works independently of the consciousness and volition of the individual, an impulse is at least partially conscious and partially under voluntary control.

4. *Imitation.*

One of the most instructive stages in mental growth is that of imitation. Here we see the process of the mediation of impulse in consciousness. Imitation represents an intermediate stage between the instinctive and the rational or mediated type of experience. It exhibits a semi-reflex, semi-conscious attempt at convergence toward an end. As Ribot says, "It gropes its way; it is

tentative." There are many waverings, many complete lapses back into the instinctive life, but there is enough mediation in and by consciousness to keep up the onward movement which eventuates in the rational act.

Imitation is a spiral rather than a circular process. Each reaction tends to reinstate its own stimulus but always with some slight modification. The important line along which this modification takes place is in the gradual substitution of an internal for the original external stimulus. Thus are formed mental pictures of the external world, so that the animal is capable of acting in the absence of an object as it would or could act in the presence of that object. This is the beginning of the ideational life. Imitation lies at the basis of all association of ideas and idealization, of all memory and imagination.

Imitation, as Baldwin says, is nothing but nascent reason. It is the great instrument of progress in mental evolution. Imitation has always the element of trial and error in it. It exhibits the individual in some sense trying to realize an ideal, though that ideal may be only vaguely and inconstantly before the mind. Children are more imitative than animals just because the child's life is more largely one of acquisitions or new adjustments, while the animal's is mainly one of mere repetitions of old adjustments. It is for this reason that the play period in children is at once an experimental and an imitative period. It is imitative because it is experimental, i. e., the imitation is for the sake of and is a means to the inventive process implied in carrying out a line of new endeavor. If one follows the transition of plays into games in children he can see how through combined experimen-

tation and imitation the vague, random, largely aimless and useless activities of the the earlier part of the play period are gradually transformed into the definite and relatively coherent games of the later stages. In this way what started out as comparatively blind impulsive activities, largely mere repetitions of previous acts either of the individual or of the race, come gradually to assume a relatively conscious mediated form, in which invention or reason plays a part.

The important point regarding imitation is its transitional nature and hence its twofold character, in which it is related on the one side to the life of impulse and instinct, and on the other side to the life of consciousness and reason. As Groos says, "It stands midway between them and aids them both. In some functions it keeps the performance going, and so allows of its perfection as an instinct; in others it puts a stress on intelligence, and so allows the instinct to fall away, if it have no independent utility in addition to that served by the intelligence. In other words, it is through imitation that instincts both arise and decay; that is, some instincts are furthered, and some suppressed, by imitation" (*The Play of Animals*, p. vi).

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CHAPTER VI. CONDITIONS AND STAGES OF THE GROWTH OF CONSCIOUSNESS.

We are now in a position to understand the conditions of the emergence of consciousness both in the race and in the individual. We can best understand the development of consciousness in the individual by a study of the evolution of consciousness in the race, just as we can best interpret the embryogeny of the organism by comparison with the phylogeny of which it is a recapitulation or epitome.

1. *The Dynamic or Equilibrium Theory of Consciousness.*

The dynamic theory holds that organic tension is the condition of consciousness. Inasmuch as this organic tension tends always to organic equilibrium, it may also be called the equilibrium theory of consciousness.

A certain amount of resistance or tension is necessary for the running of any machine. If there were absolutely no friction in the bearings, the machine would stop running. This is seen in the driving wheels of a locomotive when they revolve uselessly on a slippery track. The train cannot move until sand is poured on the tracks to give the wheels some leverage. The same is true of that psychophysical machine which we call the organism. One does not feel a well-fitting garment at all. But if it fails to fit at one point or another, there is a feeling of discomfort at that point. In the same way, there is apt to be a sudden evolution of emotional consciousness when one comes to a "To be continued" in reading a serial story.

Experiment 3:—To understand what is here meant by tension, attempt to do two things at once, the combination of which is relatively new. For example, while repeating some such alliterative phrase as "She sells sea-shells," attempt to transcribe a passage from a book.

Shield the paper upon which you write, from any side glances of the eyes.

Or try to write your name with your left hand, or to eat your soup or button your collar with the hand that you do not usually use.

Experience may be viewed as an ongoing activity. When the process of coordination or adaptation of that activity is hindered in any way, consciousness supervenes as the process of removing the obstacle to free unimpeded adjustment. This wrestling with the difficulty as with an opponent, this endeavor to surmount the obstacle, this attempt to solve the problem which the difficulty presents, gives rise to a state resistance or tension. Stated psychologically, this is attention. Attention is the mental name for organic adaptation, and is developed at the point where new habits are being acquired or where old habits are being modified in accommodation to some new situation. The conscious act is the relatively novel act on the part of the organism, the act which expresses the variant as opposed to the constant factors in its growth.

Consciousness, then, is born in friction, in the stress and strain of adjustment and readjustment. Consciousness occurs wherever new experience is being acquired. All consciousness is experience of transition. All organic structure has been built up in and through consciousness. Consciousness always develops at the point at which the organism is adjusting itself to its environment or at which its various organs are becoming adjusted to one another within the organism. Hence consciousness is a moving or shifting area of tension gyrating from point to point according to the needs of the adjustment. The process of consciousness consists in the interaction of old and new habits until a new coordination arises which solves the problem and adapts the organism in the new situation.

Consciousness arises in tension, but tends always to the restoration of the organic equilibrium. It always points to something beyond itself, to the new coordination, the new unified experience, the new act. The law is, that attention is developed at or in the point of difficult adjustment. Attention always goes to the weakest point, since it is always there that the readjustment must take place. Soon a new habit is built up at the weak point and then attention is directed elsewhere.

2. *The Conditions of Consciousness in Simple Organisms.*

Now, in the lowest organisms these conditions of tension must, of course, be very simple, and the range of alternative means which can be utilized in the attaining of an end must be exceedingly limited. Contrast the problems which present themselves to the coral polyp with the problems that are involved in the adjustment of a mammal in its environment. The environment of the former is relatively homogeneous; the environment of the latter is constantly shifting, not alone by reason of an inherent evolution of the environment, but also by reason of the constant change of scene which is brought about by the voluntary movements of the animal itself. Or contrast the hunger of an oyster with the hunger of a man, and the simplicity of the means employed to satisfy this craving in the one case with the complexity of the means used in the other. A thousand complicated economic and social relations enter into the spreading of the feast to which the civilized man sits down at every meal, while the hunger of the bivalve must, for the most part, await the food that chance throws in its way; there is comparatively

little use even of approximate, not to speak of remote, means to achieve this end.

By the primitive consciousness, things, objects, situations, are taken in their immediacy. It is only in a highly developed consciousness that one thing comes clearly to stand for another thing, or that memory images and constructive ideas split apart the inchoate present into a definitely recognized past and future. It is because of this relative immediacy of the animal consciousness that men are loath to credit him with the ability to form judgments. The distinction of means and ends can arise only where the knife-edge of the present has expanded so as to admit within it the distinction of past and future, mediated by memory and imagination. These certainly are not found in the animal consciousness as they are found in man. But though they are not found there clearly and definitely, may they not be there vaguely? May they not be there sufficiently for the purpose in view—namely, the adaptation of the organism in the given situation? We must not fall into the historical fallacy of reading back human traits into the animal consciousness. But, on the other hand, there is a counter danger, that in the attempt to avoid this error we fail to give the lower animal their due.

Experience probably begins in the form of vague flashes of feeling (or what is predominantly feeling) which come sporadically according to the exigencies of the life history of the organism. Consciousness becomes progressively organized in connection with the crises and emergencies of life; not continuously from the first, but in spots or patches or streaks. Its growth is not symmetrical, but

experience is built up at the points which happen to be crucial. Whether this or that individual organism in the species or group will be conscious, will depend upon whether or to what extent it stands in the focus of the organic tension. The first flash of consciousness in the lowest type of organism may well have been the last for that individual organism. And in great groups of organic forms where there is no evolutionary advance, the conditions of consciousness for many individuals may never be fulfilled.

The situation which will call forth consciousness in the lower animal is altogether determined by its needs either as an individual or as representing the species. Consciousness develops in connection with the crucial problems which it has to solve in order to maintain its existence, in order to survive. These vital needs and crucial problems will be connected with such conditions as the changes in the seasons; the periodicity of the appearance of vegetable food; the irregular production of animal food; the struggle for existence between animals themselves; the separation of feeding and breeding areas; glacial invasions, floods and drought; earthquakes, volcanoes and landslides; the submersion and elevation of continents and islands; the drying up of inland seas; changes of ocean and air currents; in short, any catastrophic or cataclysmic changes in nature. And to such abrupt general changes we must add all sorts of chemical agencies, physical strains and contacts, mechanical hindrances or helps to growth, changes in light, moisture, temperature, etc. These are only a few of the many conditions that might be named which would give rise to the necessity of

new adaptations on the part of organisms. It would be interesting to know in detail the steps by which certain land forms returned to an aquatic life, certain mammals took to burrowing in the earth and others to an arboreal life. What led to the divergence of the birds and reptiles from a common stock? Why did the birds develop nidification and incubation and the mammals the placenta? How did animals first come to hibernate? What stress of conditions in the struggle for life led to the keen development of the sense of smell in the deer or the hound? Under the stress of what economic problems was fire first discovered or huts first built or clothing first worn?

3. *The Criterion for the Presence of Consciousness in an Organism.*

Various criteria have been advanced for the presence of consciousness in the reactions of organisms. The most common and popular criterion is the purposefulness of the conscious act. If an animal, or even a single organ, reacts as a man would do under the same circumstances, the act is regarded as conscious. The application of this criterion has led certain writers to include instincts and reflexes among conscious acts, and consciousness has been ascribed even to the spinal cord because many of its functions are purposeful. But, as Professor Loeb has pointed out, there is evidence of purposeful response even in the tropisms of plants and, in his opinion, we are equally warranted on this principle in ascribing consciousness to machines and even to molecules and atoms. Evidently this criterion does not help us forward any, since it is no answer to the question as to the limits of consciousness to reply that all processes are conscious, including the chemical

and physical relations of atoms and molecules. This at best simply shifts the problem back a step, since if all natural processes are conscious we still have to ask what are the limits of that peculiar form of consciousness which marks off the rational from the instinctive act.

A more critical and scientific attempt to determine the criterion of consciousness is found in Professor Loeb's doctrine of "associative memory." Consciousness vanishes with "associative memory," in sleep, in anaesthesia, in the faint, in coma due to poisons, etc. Hence "associative memory" is essential to consciousness. Conscious phenomena are phenomena which are determined by "associative memory," and an animal possesses "associative memory" if it can be trained, if it can learn by experience. Such is the argument. That there is an important element of truth in the conception that the ability to learn by experience is a mark of consciousness, we shall see later. The error in Professor Loeb's view consists in identifying all consciousness with that particular type of highly organized consciousness which commonly goes by the name of "associative memory." This might be a good criterion for testing the amount or degree of mammalian consciousness, but it is entirely too restricted a standard to apply to the whole animal kingdom, not to speak of the plant kingdom.

Another theory of the criterion for the presence of consciousness stands midway between the extreme views just mentioned, and is represented by Romanes. Romanes' doctrine of the criterion of consciousness, in certain of his statements, comes back to the criterion of purposiveness, though he recognizes and attempts to obviate the

difficulties which that theory presents. But his best statement is when he makes the criterion of consciousness the ability to learn by experience. Stated in this way, his criterion asks, "Does the organism learn to make new adjustments or to modify old ones in accordance with the results of its own individual experience?" Purposiveness taken by itself, in other words, is not a sufficient criterion of consciousness. It is that purposiveness which is shown under conditions of organic tension that is conscious, purposiveness which involves the ability to choose this rather than that method of adaptation or adjustment. Purposiveness means simply adaptation of means to ends. *Consciousness means the ability to vary the use of means in the attainment of an end.* The former *may* be quite automatic. The latter alone *must* be conscious. Romanes comes the nearest to an adequate statement of the condition and criterion of consciousness.

4. *Stages in the Evolution of Consciousness.*

Summing up the points made so far, we have seen that the evolution of consciousness must have been conditioned by factors of organic tension arising in connection with the attempt to solve crucial life problems, the criterion for the presence of consciousness in an organism being the possession of ability to vary the means employed in the adaptation, the ability to use this rather than that means to get a desired end.

We come now to the consideration, of the probable stages in the evolution of consciousness. The first question to be asked would be as to the vegetable world. Are plants conscious? We have criticized the view that denies all consciousness to the lower organisms. But we

need not fall into the opposite error of supposing that the organism is necessarily always conscious. It is evident that many types which have deviated from the onward movement of evolutionary growth or have distinctly retrograded, will no longer present the conditions of struggle or tension requisite for the presence of consciousness. Herbert Spencer has generalized the truth that motion, that activity, always follows the line of least resistance. Now the line of least resistance is the line or path of habit, of automatic action. It is for this reason that motion is rhythmic. The mechanized act is necessarily rhythmical, since any variant element would interfere with the smoothness of the coordination and thus call forth consciousness. Where an organism becomes adapted to a relatively fixed environment with little or no occasion for variation in the means necessary for the adaptation, consciousness will subside if not vanish altogether. The process of adjustment becoming automatic, attention, or consciousness, is no longer needed and accordingly disappears. In this way among the lowest organisms all mind may have passed into the reflex stage after adapting the species to its environment. Such, Professor Cope thinks, is the history of the entire vegetable kingdom. Consciousness early abandoned the vegetable line, or at least is found there only in its most rudimental form. This is why the evolution of consciousness has taken place mainly along the animal line.

We have not the data from which to sketch in detail the evolution of the animal consciousness. But we may be certain that it took place in connection with the attempt to solve important life problems. A single illustration will suffice. The instinct of hunger, as Spencer has

pointed out, lies at the basis of the development of intelligence, as that of sex lies at the basis of social organization. The nutritive function as it develops implies three things wherever the problem becomes at all complex. It involves, first, the recognition of the distant food object, secondly, movement toward it, and thirdly, the oral or manual manipulation of it when reached.

The recognition of the distant object involves the psycho-genesis of the various senses, most of which finally come to be massed in the head. The first sense imagery to develop, naturally, would be the tactile imagery, because it was first and most closely associated with all the vital processes of the food function. The first tactile imagery was doubtless that developed in connection with the ingestion of the food object and, from the standpoint of the food process, all the other senses and functions may be regarded as developed ultimately for the sake of this process of manipulation and ingestion. Taste, smell, the static sense, hearing, and sight, can all be shown to have been developed for the sake of perceiving the distant food object. And locomotion is instrumental to the same end. The leg was developed for the sake of the jaw, not the jaw for the sake of the leg. All these successive developments of organs are more or less plainly designed to mediate the act of bringing the distant object to the mouth—or, at least, to mediate the manipulation of it in such a way as, sooner or later, to bring about gratification of some sort.

As Lotze has pointed out, when a person takes a stick in his hand to feel his way in the dark he thereby enlarges his immediate tactual or contact environment by

the length of the stick itself, or, looking at it from the other side, he thereby enlarges his own personality, his own organism. All the complicated machinery which in modern industry has displaced hand-work means wider scope or more delicate control over the physical forces of nature. We have brought the infinite and infinitesimal within the range of human cognition by means of the telescope and microscope. We have harnessed the energies of water, air, electricity and magnetism to widen the sphere of our activities. It is the first great upward step in the evolution of consciousness when the animal begins to state its environment in terms of its own activity. The space and time worlds represent simply the attempt of the animal to state in the form of practically useful equations the mutual relations between the tactual, the visual, and the kinaesthetic imagery.

5. *The Development of Consciousness in the Child.*

The development of the individual organism, so the biologists tell us, recapitulates the evolution of the race. The same is true of mental life. But mental development in the individual is not an exact epitome of the evolution of mind in the race. There are short cuts. Many of the ancestral stages are dropped out or so greatly abbreviated in the development of the individual that we have to reconstruct the process of growth by which consciousness evolved in the race. To accomplish this reconstruction of the phylogenetic record is the peculiar task of that branch of genetic psychology known as animal or comparative psychology. The other branch of genetic psychology is child psychology, which studies the development of con-

sciousness in the individual. Read Baldwin, *The Story of the Mind*, Chap. IV.

The most prominent characteristic of the healthy child is his irrepressible activity and impulsiveness. His experience is like that of the animal in its immediate, affective, and impulsive character. Like the animal, the child is dominated more by deep-lying instincts than by deliberate reflection.

But the child differs vastly from the animal in two respects: its capacity, and its suggestibility. The child's superiority on the side of capacity is due to his human ancestry, his human inheritance. He has the germs within him, the possibilities, of intellectual and moral growth, which are the result of long eras of struggle and the gradual emancipation of the human, from the restrictions of the animal stage of existence. On the side of suggestibility, the human child far surpasses the lower animals. Suggestibility is just another name for educability. The child is teachable as the chick or kitten or dog or horse is not.

The significance of the fact that the child's experience is so predominantly impulsive and affective in character lies in the fact that this leads the child to endless experimentation with and in his environment. He is constantly handling objects, questioning those older than himself about them, and examining into the What, the How, and the Why; the Whence, the Wherefore, and the Whither of things. And, coupled with this impulse to curiosity, is the impulse to imitation, to copy, to attempt, at least, to do everything that he sees others do. In this way he comes into contact with an immensely wider environment and

with a greater range of objects than he would if he did not possess these fundamental propulsive tendencies to action.

One feature of the child's development which seems to reflect in a way the evolution of consciousness in the race is the fact that these instincts and impulses of the child seem to have, each its own period when it is at the height of its development. Now it is the nursing instincts, again it is imitativeness, at another time it is the impulse to locomotion, at another, the impulse to speech, at another, the nomadic impulse or the tendency to run away, at another, the impulse to sociality, etc. In order that the growth of the child shall be most healthful and rapid, these impulses should be utilized, each at the acme of its development, for the expanding and controlling of the child's experience along that particular line. The following are some of the more important stages in the child's mental growth.

6. *Stages in the Development of Consciousness in the Child.*

(1) The Pre-Imitative Period (roughly, the first year). This is the period of most immediate or direct experience. It is spontaneous and instinctive. The first year of the child's life consists largely of pains and pleasures. There is little, if any, definite, though there is much indefinite, cognition. Sensations are vague and surcharged with feeling. Memory is little developed. But instincts are strong and impulses are restlessly active. The beginnings of distance and color perception, locomotion, and preference for the use of the right or left hand, are developed towards the close of this period. The most important

attainment is the development of a considerable number of voluntary movements.

(2) The Imitative Period (roughly the second year). Next comes the imitative period which is at the same time the beginning of the experimental period. Whether this plastic or formative period lasts into later life or whether these early imitative tendencies harden soon into habits, depends largely upon the child's heredity and upon the character of his environment. As has already been seen, the imitative period is also the time when the originality and individuality of the child assert themselves. One of the most important acquisitions is the understanding and use of spoken language. Voluntary control also increases throughout this period.

(3) The Play Period (roughly the third to the seventh year). In this period the child at first follows indiscriminately the chance images of the moment. But gradually these vagrant images get relatively definite and constant contents, and these contents or meanings are held with increasing permanency before the mind. This is the period of plays and games. Play begins in the impulsive activity and uncontrolled imagery of the preceding period, but it reaches a higher expression in the more intelligent games of this period, in which there is recognition of an end held with some consistency before the mind, and of the appropriate means for the attainment of that end. Of course, the growth of language and the further refinement of all forms of motor activity proceed rapidly throughout this period, both being greatly assisted by the wider physical and social environment with which the

child now comes into contact. The important educational problem for this period is the formation of good habits.

(4) Period of the First Clear Consciousness of Means and Ends (roughly from the seventh to the thirteenth year). In this period the vague and fitful consciousness of means and ends, which characterized his plays and games in the preceding stage, is gradually transformed into the clearer definition of certain ends or ideals as desirable, and the firmer grasp upon certain means or methods for reaching those ends. Professor Dewey suggests that this might be called the beginning of the consciousness of "work," not in the sense of drudgery or tasks, but in the sense that the child now controls and regulates what he is doing with reference to certain ideas or ideals which serve as standards or criteria of his action. Hence this is the time for teaching the child all such special activities as require practice to produce skill, e. g., penmanship, fingering musical instruments, arithmetic, grammar, etc. The important educational necessity of this period is the training of discriminative attention.

(5) The Period of Adolescence (roughly from thirteen to eighteen or twenty). This is the period when the sexual and social impulses assert themselves in their greatest strength. Puberty is the period when the development of self consciousness takes great strides, and the individual tends to break away from all previous ties and to set up for himself, intellectually as well as socially. Along with self consciousness, a hitherto undeveloped social consciousness discovers itself in the individual: he becomes conscious, not only of rights, but of obligations to his fellow men. In fact, his self consciousness is a so-

cial consciousness. This is a period of great enthusiasms, of high ideals, of noble endeavors. It is the most critical and reconstructive period in the whole life of the individual human being.

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CHAPTER VII. HABIT AND ATTENTION.

I. *Habit.*

The subjects of habit and attention are bound up together. Habit is the stable element, as attention is the variant element in experience. A habit originates as a conscious act which has become mechanised. But this process of the mechanisation of one act is accompanied in the higher types of organisms by a corresponding mediation or intensification in consciousness of some other act or acts. Habit implies attention and attention implies habit. The growth of consciousness results from a process of interaction of habit and attention. Let us examine the laws of habit first.

Just as variation is essential to the formation of habit, so habits are presupposed in all attention, otherwise what would we attend with? We use our already formed habits to attend to some new situation, to solve some new problem. If those habits prove inadequate, we then make

them over so that they will be adequate, i. e., we turn the attention upon the habits themselves. Thus it is the same process of organic adaptation which from the one side we call habit and from the other side, attention. Attention means simply the re-adjustment and, if need be, the modification, of existing habits, the re-direction of already coordinated activities. This may be seen, for example, in the transformation of walking into bicycle riding as a mode of locomotion. The new habit could not be formed so quickly if there did not already exist the set of walking habits which simply require modification for the new type of movement.

Habit thus represents the conservative factor in experience. Hence habit is often supposed to result from the mere repetition of an act until it becomes automatic. Repetition is an important element in the formation of habit, but it is not the only factor. Repetition is usually an indispensable factor, but it is rather to be regarded as the sign that a habit is being formed than as the cause of its formation. We can learn to do some things after a single trial, while we can try to do other things for a long time without forming a reliable habit. A habit depends rather upon the vital character of its relation in the total experience than upon the mere fact of repetition. Habit depends upon facilitation of the coordination, and such facilitation may result from rational insight, in some cases, rather than from the mere number of times it has been performed.

2. *Attention.*

Attention is the relatively novel and variant factor in experience. It is the growing-point of consciousness.

Attention always means tension. It is the psychological aspect of organic adaptation. Attention always goes to the point of difficulty and effort in the adjustment, e. g., if there is a cinder in your eye, your whole consciousness centres for the time being in that organ. That process of the concentration of consciousness is attention. It is not a separate faculty: it is simply consciousness focussed on a given situation.

For this reason attention always follows the accommodatory acts of the sense organs and muscles. Attention is the point in our experience where we are most intensely conscious, and we are always most fully conscious of those acts which are relatively the most difficult and which are the newest to us. Attention locates the point of stress where the need of consciousness is the most urgent and pressing. That "catches our attention" which is relevant to some need or want of our experience.

Experiment 4:—Put a dot in the centre of a sheet of unruled white paper. Fix the eyes on it without winking and as far as possible without any other movement. Attempt to exclude all ideas but "dot." Is this possible, absolutely? Why? What would perfect attention mean?

All forms of attention are ultimately traceable back to motor attention. Karl Groos says that attention in its earliest manifestations is a means for the furtherance of the struggle for life. The instinct of lying in wait, of holding one's self in readiness to seize prey or for flight, is the elementary form of attention. Note the expressions of a person in perplexity or engaged in hard study—the knit eyebrows, the fixed gaze, the tense attitude, the suspended respiration. The Indian on the trail, the wild

beast stalking its victim, the child absorbed in its game—all these illustrate the motor aspect of attention. This is the truth in Ribot's statement that if you wholly suppress bodily states you suppress attention, and of Maudsley's statement that he who is incapable of controlling his muscles is incapable of attention.

Here is the clew also to the relation between attention and sensation. When attention becomes definitely localized we get sensation. I do not attend to things in general only, but to this or that object. I *see* a hat or *smell* a rose or *hear* a whistle or *feel* a draft or *taste* an orange. Attention is always located in some degree. There is no attention which has not sensational elements in it. Even the most abstract thought is carried on in terms of visual or auditory or kinaesthetic imagery, which ultimately comes back to the sense qualities and relations of things in space and time.

Curiosity is one of the earliest and most useful exhibitions of attentive consciousness. Its value in the struggle for existence is obvious. As a means of revealing hidden dangers, of opening up new avenues of escape, of devising new ways of doing things, it would soon give its possessor a superiority in competition with its fellows and with the opposing forces of the environment. Curiosity is a combination of playfulness and a sort of experimentation with the unknown object.

3. *Inhibition.*

So far we have been speaking only of the positive aspect of the process of adaptation. But every act of attention means that all or that many other activities are inhibited. The selection of one coordination means the

rejection of other coordinations. Attention on the positive side is concentration ; on the negative side it is inhibition. The concentration of attention takes place by means of the inhibition of other activities. But this inhibition does not mean the exclusion of these other activities from the process of adaptation : it means their subordination to the main line of adjustment. They contribute to, instead of opposing the success of the adaptation. The singer inhibits the spasmodic convulsions of the diaphragm due to nervousness, but only to utilize that very muscle for the production of a pure and sustained tone.

The importance of inhibition appears in the ability to attend to that only which at the time demands the attention, leaving all the irrelevant details out of the account. The mark of genius is the ability to seize upon the salient point of a situation and not to be led into blind alleys by irrelevant issues. Many people think too little with their brains and too much with the eyebrows, scalp, mouth, tongue, arms and legs. Of course, it is not possible to think without muscular tension at some point, but it is possible to reduce the superfluous and irrelevant tension which is only a waste of nervous energy. This is the end and aim of all education—the increase of central control over the unorganized peripheral activities.

4. *Concentration of the Attention.*

All attention is rhythmic or intermittent. Attention comes and goes in pulses or waves. That is, attention cannot remain constant in the same direction for a long period. Change is the condition of attention, as it is the condition of all consciousness. Attention is possible only

as a reaction to intermittent stimuli. A man living near Niagara does not hear its roar. The miller does not hear the rumble of his machinery. This is nature's attempt at economy in the growth of experience. All organic acts tend to become rhythmic and, unless brought repeatedly into the focus of attention, do become rhythmic and automatic. Rhythm is nature's way of relegating into the background of consciousness all the irrelevant details which otherwise would obstruct the progress of experience. Suppose you had every detail of your past life before you, suppose you could at the present time hear the noise of all the steps taken on the pavements of Chicago and San Francisco as clearly as those on your own street. You would be overwhelmed with the mass of details. Hence this fact of rhythm and of the mechanisation of rhythmic coordinations is a great labor-saving device.

Experiment 5:—Classify your studies with reference to the degree of attention required to prepare them for the class-room.

Experiment 6:—Put a just perceptible grey spot in the centre of a sheet of white paper, e. g., a spot an inch in diameter held ten feet away. Gaze fixedly at it. Note the alternate disappearance and reappearance of the spot.

Experiment 7:—Listen to the ticking of your watch, the puffing of a distant locomotive, the dripping of water, to any periodically recurrent sound. Do you notice any tendency to group the sounds? What is the significance of this?

5. *The Scope of Attention.*

How many things can we attend to at once? This is the question as to the scope of attention? The answer is, that we can attend to but one complex object at a time but that this complex object may embrace within it many different things. Consciousness can focus on only one

point at a time but there is a marginal consciousness. It is true that we can in some cases carry on two and even three attentional processes at once, but in such cases either the processes are organically related to one another or there is a rapid alternation or oscillation from the one to the other. To see this oscillation compare the experiments below. The fundamental law of attention is, that all the elements attended to *in one and the same act* become factors within one total idea or unit of meaning.

Experiment 8:—Have two persons read aloud to each other, each attempting to follow the story read by the other. Does the reading tend to become automatic? Is there vibration of the attention from the one process to the other, i. e., from the listening to the reading, or *vice versa*.

Experiment 9:—In passing by a shop window or by a furnished room, glance in for a moment, and then see how many details you can clearly recall. Is there any evidence of fluctuation of the attention?

Experiment 10:—Fixate a letter or word on the printed page. Keeping the eyes fixed on this point, draw a line to mark the area within which you can distinguish the letters without moving the eyes.

Experiment 11:—Have some other person throw down several small objects such as matches or pennies and then gather them up again before you have time to do more than take a casual at them. How many can you take in at a glance?

6. *Attention and Interest.*

We attend only to objects which have some interest for us. The object need not please us: we may fear it and hate it. The man who stared the lion out of countenance had no love for the lion, but his interest and attention were the most intense. It is not true that we can attend to anything we please, for attention is the slave of

interest, and interest roots in the semi-instinctive life of the feelings, and these instinctive feelings have a deeper and wider significance than the mere pleasure of the moment.

7. *Habits of Attention.*

It has been said that we never know a thing thoroughly until we can do it unconsciously. This means that there is such a thing as acquiring special habits of attention. If you start at the clap of thunder or at the slamming of the door, or jump from the flying missile, it is because through long ages in the struggle for life such reactions have been useful for the preservation of the organism. These almost instinctive reactions are sometimes called involuntary attention. They are to be clearly distinguished from true or voluntary attention in which we deliberately focus consciousness on an object or idea. Habits of attention are thus simply tendencies toward typical modes of reaction to typical situations. All so-called mental faculties are simply habits of attention. All attention is nascent movement and tends to become automatic. Thus we see that while on the one hand attention is born out of the conflict of opposing habits, on the other hand habits arise out of the very process of attention when this process becomes uniform and rhythmic.

Experiment 12:—Glance casually over a printed page and note what phrases and words catch the eye. Are they related to your dominant interests or pursuits? Compare the results with what catches the eye of another person glancing over the same page. Repeat the experiment on different occasions and under different conditions of interest and occupation.

Experiment 13:—Take your left hand in your right hand, and note

carefully your sensations. Are they located in the left or in the right hand? What determines the point where the sensation of contact is felt?

Experiment 14:—Examine the illustration on page 295 of Jastrow's "Fact and Fable in Psychology." What does it represent? What determines your apperception of the picture?

8. *Volition.*

Attention in its highest expression is called volition. Volition is attention under circumstances in which we identify ourselves so unmistakably with the act that it seems to result wholly from our will. Of course, no act is wholly determined from within, and no act is wholly determined from without. But in some cases the initiative seems to lie more on the side of the organism than on the side of the environment, and in such cases we speak of volition. We give the name of motives to those feelings or ideas which influence us to action. And we give the name of will to that action which is prompted by clearly thought-out motives, which is the result of mediation, reflection, deliberation, choice.

9. *Summary on Attention.*

(1) Attention is the focussing of consciousness and is correlative with habit in the process of organic adaptation.

(2) Attention is the psychological aspect of organic tension.

(3) Attention as concentration of consciousness always implies the inhibition, in the sense of the subordination and utilization, of the forces not in the focus of consciousness.

- (4) Attention is always rhythmic or intermittent.
- (5) The scope of attention is restricted to a single situation, but that situation may be indefinitely complex.
- (6) Attention seeks the maximum of cognition with the minimum of effort, the fundamental law being that all the elements attended to in one and the same act become factors within one total idea or meaning.
- (7) Attention is the slave of interest.
- (8) Obstructed habits give rise to attention and uniform modes of attention give rise to habits.
- (9) Volition is the highest form of attention.

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PART II. FEELING.

CHAPTER VIII. GENERAL NATURE OF FEELING.

I. *What is Feeling.*

Feeling is the simplest mode of consciousness. It is unmediated consciousness. It is vague, immediate, and relatively uncontrolled. Pure feeling, wholly unmixed with cognition, probably does not occur; but consciousness may be so predominantly affective in character that the element of cognition plays only a small, though not an unimportant, part. The phenomena of feeling are always obscure, indefinite, variable, and uncertain, as compared with the phenomena of cognition, and for this reason are peculiarly difficult to study introspectively.

2. *Relation of Feeling to Action.*

Feeling is the first form which our impulsive acts take when they are brought to consciousness. Feeling represents our activity coming to consciousness, but coming to consciousness in a relatively uncontrolled way. When we first become conscious of some activity which we hitherto have performed unconsciously we feel rather that it possesses us than that we have it. This is the characteristic of all feeling before it has been brought under reflective control. It dominates consciousness. It rules us instead of our being masters of it. We are identified with the feeling. This is why feeling is so subjective and personal in character. We can endure a challenge of our opinions, but not a thrust at our emotions. These are too much a part of ourselves. In contrast with feeling, thought is objective and impersonal.

Feeling is rooted in instinct and represents certain

relatively unstable instincts, under conditions of organic tension, coming to consciousness as impulses for reconstruction and readaptation. It is because of its relation to the subliminal instinctive life that feeling is so closely identified with the self, for it is this infinite background of instinct which constitutes the unfathomed depths of selfhood. This solves the mooted question as to the priority of feeling. Feeling is prior to cognition in the sense that it is the first inchoate stage of cognition.

3. *Relation of Feeling to Cognition.*

Feeling is unmediated cognition. Cognition is controlled or mediated feeling. Pure feeling is an abstraction. Actual feeling always has in it the beginnings of cognition. But these cognitive elements are always of the most indefinite sort, connected as they are with vague organic, dermal, and kinaesthetic sensations. Indeed, feeling is just unlocalized sensation. Feeling may be regarded as a closely welded complex of organic with other sensations, which has not as yet yielded to cognitive differentiation, and hence has not been brought under voluntary control. This accounts for the impulsive character of feeling as contrasted with the rational and reflective character of cognition. The organic sensations, touch, the temperature sensations, the kinaesthetic sensations, taste and smell, stand nearest to the life of feeling. Hearing and sight stand furthest away from feeling and nearest cognition. Feeling, therefore, is a vague appreciation of the value of an act, while cognition is a clear and definite perception of the object which is valuable. This answers the much debated question as to whether pain and pleas-

ure are sensations. Yes, they are sensations—in the making.

Cognition or thinking, therefore, is controlled feeling, in two senses: it tends (1) to suppress or inhibit the expression of feeling, but ultimately for the sake (2) of directing feeling to new or modified ends.

4. *Feeling as Interest.*

Our thinking and acting are largely determined by our feeling, by our interests, as, in turn, our interests are determined by our habits of attention, i. e., by our thinking and acting. We perceive and we perform what we are interested in. Our plans and our acts are not only colored by but are instigated by our emotions. This is not to say that the emotion is the cause of the act, but it represents the first stage of the activity as conscious—the initial conscious stage, just as cognition represents the terminal conscious stage of the act. Every conscious act undergoes mediation in feeling and thought.

Hence feeling, like thinking, is valuable primarily not in and for itself: it is valuable if and in so far as it leads to action. Too much feeling obstructs thought and thus leads to impulsive instead of reflective action. Thinking and acting cannot go on profitably when feeling is too intense. On the other hand, the more feeling the better—if it is under control. All great men are men of strong passions.

Feeling as interest represents the transition from an act through a thought to a new act. Interest, in other words, is feeling in the process of passing over into cognition. It is not the man of intense feelings that we respect, but the man of thought and action—the man who

has his feelings under control. The feelings like the appetites and passions are good—when harnessed.

5. *Theories as to the Nature of Feeling.*

There are three types of theory as to the nature of feeling :

(1) The theory that holds that feeling is one of the fundamental aspects of consciousness and radically different in character from cognition.

(2) The theory which holds that feeling is an aspect of some other mode of consciousness, e. g., an attribute of sensation.

(3) The theory which holds that feeling is a fundamental mode of consciousness, but related to cognition simply as the vague and undefined matrix out of which cognition arises.

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CHAPTER IX. THE PHYSIOLOGICAL CONDITIONS OF FEELING.

1. *The Physical Basis of Feeling.*

The physical conditions of feeling are found in changes in the organic functions of digestion, nutrition, circulation, and respiration. These changes are largely brought about through the sympathetic nervous system, and hence take place for the most part subconsciously. Experiment has shown that the feeling consciousness is rhythmic, that it rises and falls, and alternates between pleasure and pain

according to these physiological changes. Pleasure is connected in general with processes which tend toward the preservation and welfare of the organism; pain, with those processes which tend toward its destruction or disintegration.

2. *The Physical Expression of Emotion.*

Feeling, lying nearer to action than cognition, finds more direct expression in physical movements of all sorts. Emotional expression is almost if not wholly instinctive. Given a certain situation or experience, and we cannot help feeling thus and so about it. Every experience which is of interest to us calls forth these involuntary emotional expressions as the sign of its positive or negative value for the organism. These emotional reactions may be so inhibited that they do not find overt expression, but a closer examination will reveal their presence in the quickened pulse and respiration, the altered tonicity of the muscles, and other physiological conditions such as changes in the secretion of glands, etc. Darwin has shown in detail the muscular expressions for all the typical emotions.

3. *Theories of Pain-Pleasure.*

(1) The central theory maintains that feeling is a primary faculty of the soul which is dependent upon perception and leads to volition. Feeling is regarded as a sort of psychic force, pent up in the soul, which is seeking an outlet. The order, according to this theory, is perception, feeling, action. You see a bear, are afraid, and run away.

(2) The peripheral or James-Lange theory maintains that emotion is the reflex in the consciousness of the or-

ganism of its overt or its incipient acts. The order, according to this theory, is perception, action, emotion. You see a bear, run away, and are afraid.

(3) Herrick's Summation-Irradiation theory maintains that emotion is conditioned upon organic tension, pain being due to organic congestion and summation of tendencies to action, and pleasure being due to relatively free discharge or irradiation, after not too prolonged or severe inhibition of these tendencies. It is true to say neither that emotions are caused by movements (peripheral theory) nor that emotions cause movements (central theory), but that emotion or feeling *is* action in its incipient stage of conscious mediation, just as thinking is action in a later stage of mediation.

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Calkins, Intro. to Psychol., Chap. IX.

CHAPTER X. THE PSYCHOGENESIS OF THE EMOTIONS.

I. *The Biological Significance of Feeling.*

All emotions express tendencies which were useful to our animal ancestors. These tendencies, many of them, are no longer useful to us, yet they cling to us in the form of unconscious or instinctive reactions largely beyond our voluntary control. Feeling or emotion arises when one or more of these instinctive tendencies comes into conflict with another or with some conscious activity.

The instinctive acts come in to obstruct one another or to interrupt the conscious and rational acts of experience. This obstruction or interruption causes an organic tension or struggle between the two rival tendencies, and this tension is reflected in consciousness as feeling or emotion: it *is* the feeling or emotion. As soon as these two contending forces are brought under control, feeling gives place gradually to cognition. Not that all feeling disappears, but that that particular tensional phase of experience undergoes transformation into thought and, ultimately, into action. Pain is connected with the mal-adjustment and obstructive phase of the tension; pleasure, with the successful adjustment and reconstructive phase.

2. *The Evolutionary Origin of Pain.*

The primitive consciousness was predominantly a feeling consciousness. And feeling probably first appeared as pain. Not that consciousness arose at first as pure or bare pain. Such states of consciousness, if they are conceivable at all, could have had no evolutionary utility. But the primitive consciousness presents the immediacy, the unmediated character, of feeling, as contrasted with the mediative, the *reflective* and *projective*, character of cognitive consciousness. The primitive consciousness partakes of the character of the feeling life also in its relatively unorganized and chaotic character, lacking both the continuity and the coherency of cognition. The same is seen in the early consciousness of the child. Consciousness came first in discontinuous flashes, in sporadic streaks and patches.

But that these early manifestations of consciousness were potentially cognitive as well as affective in character

is clear from the fact that they are an expression of and arose as attempted adjustments of vital needs of the organism. Why should the feeling of pain or pleasure ever have arisen if it did not serve some useful purpose for the survival of the organism? And of what service would pain be as a monitor unless the organism could respond by some perception of the situation? A bare or pure feeling of pain would be of no service unless or until it stimulated some adaptation on the part of the organism, and when the latter process takes place we have all the essentials of the cognitive process, involving the projection of purposes or ends. Of course, among lower orders of organisms these ends will be projected only in a vague and relatively uncontrolled way, and it is for this reason that we characterize such a consciousness as affective and impulsive as contrasted with the rational and reflective consciousness of higher organisms.

3. *The Origin of Pleasure.*

Why and when pleasurable feeling first appeared is still obscure. But if, as Stanley suggests, two extremes of pain early became differentiated, lack-pain and excess-pain, then pleasure may have originated as a feeling of relief from the extremes of pain. Aristotle said that pleasure is the sense of unimpeded energy. If this is correct, we have here the element of truth in the conception of the so-called neutral feelings or indifferent feelings. These are really not feelings at all, but represent the lapse of experience back to the instinctive level, though, it may be, on a higher plane than before. But whatever pleasurable feeling may have been at first as the mere negation of extremes of pain, later it clearly gets a positive significance

on its own account. As pain comes to stand for the consciousness of failure, of defeat, so pleasure comes to stand for success, for achievement.

4. *The Order of Evolution of the Emotions.*

The egoistic or self-preservative and the altruistic or race-preservative emotional attitudes must have developed together. Hunger and love, which, Schiller said, are the two forces which move the world, certainly lie at the basis of mental evolution. Out of these rudimental cravings evolved the defensive emotions, fear, surprise, jealousy, etc., on the one hand, and the offensive emotions, anger, curiosity, pugnacity, etc., on the other. The exact order of the development of play, sympathy, emulation, pride, shame, deceitfulness, the appreciation of the ludicrous, swearing, etc. is not known, but as we unravel the psychogenetic record of instinct we see that each has served a useful purpose in the evolution of consciousness and has left its vestige in our highly complex human consciousness.

5. *Food and Sex Feelings.*

Hunger and thirst, the alimentive appetites, and sex, the reproductive appetite, constitute probably the first modes of the affective life. In their simplest beginnings these experiences must have come as unmediated cravings, with little or no retrospective or prospective reference (memory or imagination)—just simple immediate experiences of disagreeable or semi-agreeable feeling of the type of animal craving. Of course, these simple states of feeling will be accompanied by the rudiments of cognition. But at first these beginnings of preception will be all but swamped in the feeling-consciousness. The cognitive aspect first clearly

emerges in the effort-feelings, which imply a certain projection of the desired object and a consciousness of stress and strain in the attempt to attain it. The memory-imagination function comes in simply as an instrument for widening the scope of that tension which is the fundamental condition of all consciousness, so as at once to relate and to hold apart objects and events remote in space and time.

6. *Fear and Anger.*

The early conscious life of the animal is a succession of almost wholly disconnected flashes of uncomfortable feeling. There is comparatively no organization in that experience, and for that reason no memory and no idealization, no past and no future. The first organization of these flashes of pain seems to be in connection with the evolution of the emotion of fear, the defensive emotion. Fear is a prospective emotional attitude, implying also some representation of past painful experiences. Stanley calls fear anticipatory pain. He points out that the evolution of the capacity for fright was a most important requisite for the preservation of the animal. Other things being equal, the animals most easily frightened, in the midst of many destructive agents, had the best chance for survival. Animals which must receive actual injury before experiencing pain would clearly be inferior to those which were capable of experiencing the emotion of pain before the injury was actually received.

7. *Classification of the Emotions.*

All feelings root in effort feelings such as appetition and aversion. Of these there are two main classes, with the following subdivisions :

(1) Failure feelings

(a) Feelings of realized failure

1) In present adjustment

a) Organic:—feelings of bodily dissatisfaction, fatigue, discord, impotence.

b) Abstract:—e. g., grief, sorrow, misery, etc.

2) In past adjustment:—e. g., regret, remorse, rankling, etc.

(b) Feelings of anticipated failure, i. e., in future adjustment: emotions which tend to avoid and exclude the object:—e. g., fear, anger, hate, etc.

(2) Success feelings

(a) Feelings of realized success

1) In present adjustment

a) Organic:—Feelings of bodily satisfaction, buoyancy, harmony, power, etc.

b) Abstract:—e. g., joy, happiness, bliss, etc.

2) In past adjustment:—e. g., gratulation, gratitude, relief, etc.

(b) Feelings of anticipated success, i. e., in future adjustment: emotions which tend to seek and incorporate the object:—e. g., hope, sympathy, love, etc.

8. *Emotional Types.*

Emotions differ as to the way in which they find expression. Some are irruptive. Such emotions rise to a climax quickly and exhaust themselves speedily. They are called passions. Others are intermittent. These emo-

tions are variable and spasmodic in character. They are called moods. Still other emotions are uniform and cumulative in expression. These form what is commonly called disposition. According to the interrelations of these various types of emotion we get the different temperaments of which there are usually distinguished four main types :

(1) Sanguine : quick, strong pulse ; light hair and eyes ; fair skin ; cheerful disposition ; great lung and heart power.

(2) Bilious : excessive nutrition ; strong, slow pulse ; dark hair and eyes ; muscular ; strong will and passions, melancholic.

(3) Lymphatic : adipose tissue ; full cheeks ; flabby muscles ; soft skin ; easy going ; phlegmatic.

(4) Nervous : narrow chest ; slight build ; delicate taste ; vigorous mind ; studious habits.

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PART IV. THINKING.

CHAPTER XI. THE GENERAL NATURE OF THOUGHT.

1. *What is Thinking?*

Under what circumstances do we think? What is the occasion for our ever thinking at all? We have said that thinking is introducing order and control into our experience. But why should we ever desire to order or control our experience? Why not always rely on the more immediate modes of experience such as instinct and feeling? What ever starts us thinking, as over and above merely feeling? The reply is, that it is because these other modes of experience fail us often at the critical point, at just the point where they are most needed. Thinking comes in because it is more successful; it is a more economical and a more expeditious mode of attaining the ends of experience than blind instinct or vague feeling. Instinct and habit are useful and indispensable wherever the conditions are uniform. Feeling is important as a monitor. But thinking is essential for the solution of the more critical problems of adjustment and reconstruction which arise in a growing experience.

The same result may be reached accidentally, as, for example, in the case of cats opening doors by pulling latches or turning buttons. But the method of thinking is much more economical. The cat may learn to open the door by pulling at the latch. But, as James says, "no cat, if the latch got out of order, could open the door again, unless some new accident at random fumbling taught her to associate some new total movement with the total phenomenon of

the closed door." "A reasoning man, however, would open the door by first analyzing the hindrance. He would ascertain what particular feature of the door was wrong. The lever, for example, does not raise the latch sufficiently from its slot—case of insufficient elevation—raise door bodily on hinges ! Or door sticks at top by friction against lintel—press it bodily down!"

2. *Thought is an Organic Growth.*

Thinking arose in the history of life because at some point mere mechanical instinct failed to serve the organism so well as teleologically directed thought. Thinking is essentially a biological function which enables the organism the better to adjust itself in its environment. It is the instrument of progressive growth in organic evolution. Consciousness must be regarded as having in it from the first the elements of cognition. Thought or judgment unfolds its parts in our experience as organically as the germ of a plant unfolds the roots, leaves and flowers, or as the embryo develops into the adult animal form.

3. *Thinking is the Mediation of an Interrupted Action.*

Thinking always comes as, relatively, the interruption of an act. We *stop* to think. Thought may be called repressed action. Bain says that thinking is refraining from speaking or acting. Thought, however, is not something absolutely different from activity ; it is activity in a different form. It is central and cerebral rather than peripheral and overt ; and it is definite and controlled rather than random and haphazard.

Thinking arises at the point of some break in the activity. This break presents a certain difficulty or obstacle to be overcome. There is never, of course, a com-

plete break-down. That would mean insanity, total mental collapse. But the adaptation fails or is inadequate to such an extent as to bring the process of adaptation itself to consciousness, and attention and thought come in to heal the breach in the process of experience.

Thus thinking is mediation ; it is transformation. It is the attempt to do consciously what it has been found impossible to do unconsciously by instinct or habit. If our experience is to go on, we have got to meet the situation, we must so modify our habits that they will serve us in this new emergency. The thinking is this process of modification—which may be regarded either as a reconstruction of the old experience or as a construction of a new experience. Reconstruction is the key to the process of thinking, for it is the old habits and instincts and impulses made over, which enter into and constitute the new experience. A certain part of the total experience gets set up as an ideal or end to be reached, and another part of the experience is regarded as the instrument or means by which to reach it. These come into opposition and interaction in this process of mediation and some new type of experience is the outcome.

4. *Thinking is a Doubt-Inquiry Process which Arises in Connection With the Attempt to Solve a Problem.*

The break in the experience which stimulates the process of thinking presents certain difficulties to be overcome by thought which could not be overcome by mere instinct or feeling. In other words, all thinking is of the nature of an attempt to solve a problem. At least, this is the way thinking arises in the first instance. In much of our thinking as adult human beings this fundamental

feature of the thinking process is overlaid by derivative habits, but they all come back ultimately to this biological and utilitarian reference for their significance.

Experience becomes problematic, then, when there is some break in the adjustment process, and this means, on the one hand, that some former mode of experience, some old instinct or habit, has proved inadequate, so that we come to doubt its utility. On the other hand, the process of mediation means that we are seeking for some new habit or to make some modification of an old habit that will serve to repair the break in the experience. Thinking thus presents two aspects, according as it involves a doubt of existing modes of experience and a search or inquiry for a new and better mode of experience. That is, on the negative side, thinking means *doubt*; on the positive side, thinking means *inquiry*.

(1) On the negative side thinking is doubt. That is, thinking arises because of some failure in experience. The previous experience has broken down in face of some new situation. Our habits or instincts have not served to keep up the activity of adaptation necessary to life. There is seldom or never a complete failure, but the failure is sufficiently serious to lead us to doubt the serviceability of our previous habits or modes of action to meet this situation.

(2) On the positive side thinking means inquiry. Doubt leads to inquiry. Failure in its positive aspect means doing better next time. So long as a person's experience flows on smoothly, he never has any occasion to do what we call thinking; he never puts his experience into the form of a judgment, because he has no obstacles

to overcome and hence no problems to solve—there is no break in his experience, hence no consciousness of failure, and hence no necessity for inquiry after a better method so as to succeed next time. We do not have to think or judge except in relation to some adjustment or readjustment in our experience. Doubt and inquiry emerge in the conflict which results from obstructed activity. Thus thinking is the passage from one experience to another: in doubt we see the retrospective reference of thought to the past inadequate experience; in inquiry we see the prospective reference to the new forming experience which as yet is only an ideal.

5. *Thinking is Always Instrumental to Action.*

Thinking not only arises out of action, but is for the sake of action. The aim and end of an idea is an act. We call a man who does not bring down his ideas to the test of realization in the actual world a dreamer, a visionary. Thinking is, ultimately, not an end in itself, but a means to an end. It is secondary and derived—a mediate form of experience growing out of action, instinct, habit, feeling, which are the original and primary and immediate modes of experience. We think *about* or *on* our experience. Thinking does not end in itself; thought always tends toward the restoration of the disturbed equilibrium of the experience. That is, all thought is dynamogenic. The theoretical is for the sake of the practical, not the practical for the sake of the theoretical. Even abstract philosophical and scientific thinking find their ultimate justification and realization in the practical everyday conduct of life.

6. *Stages in the Growth of Thought.*

- (1) The pre-reflective or instinctive stage.
 - (a) The lower animals
 - (b) The savage and the child.
- (2) The Reflective or Rational Stage.
 - (a) Common-sense Judgments.
 - (b) Scientific Judgments.
 - (c) Philosophical judgments.
- (3) The Post-reflective or intuitive stage.

7. *Sensation and Idea.*

All thinking or cognition involves both preceiving and conceiving, both sense and thought, both sensation and idea. The acquisition of the material of knowledge takes place through sense. The transformation and methodizing of this knowledge takes place through thought. But these are not separate faculties: they are correlative functions within the mediative process of thinking. The experience of the child at first, as James has remarked, is just "a big, buzzing, blooming confusion." But with the differentiation and integration of his experience, the child gradually comes to distinguish, for example, between the color, the size, the weight, the taste and the smell of an orange, and to group the like qualities of oranges and balls and the moon into the general idea of a round object or sphere. The means by which this two-fold process of differentiation and integration takes place are perception through the senses and construction by thought. These processes are interdependent throughout, but for convenience we will treat first of the senses and then of Memory and Idealisation, which make up thought proper as distinguished from sense.

Thinking is the attempt to organize and mediate, to modify and reconstruct, our activities as they are presented in sense. Ideas are simply the ordering of sensations. The function of sensation in the process of mediation is to present the problem or the data. The function of ideas is that of suggesting and working out a method of solution. Sensations present the *material*, and ideas the *method*, of thought.

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- Stout, Manual of Psychology, Bk. III, Division I, Chap. I; Bk. IV, Chap. I.
 Dewey, Psychology, Chap. VIII.
 Ladd, Outlines of Descriptive Psychology, Chaps. XII & XIII.
 Halleck, Psychol. & Psychic Culture, Chaps. VIII & IX.
 Calkins, Introduction to Psychology, Chaps. XVII & XVIII.
 Höfding, Outlines of Psychology, V, B.

CHAPTER XII. THE GENERAL SENSES.

1. *The Conditions of Sensation.*

- (1) The Physical Stimulus.
- (2) The Sense Organ.
- (3) The Central Nervous and Motor Mechanism.
- (4) The Functions of the Brain and Cerebral Localization.

(5) Flechsig's Sense Areas and Association Centres.

2. *The Attributes of Sensation and Weber's Law.*
3. *The Affinity of the Senses.*
4. *Classification of the Senses.*
5. *The Organic Sensations.*

Experiment 15:—Have another person tickle you with a feather. See if you can introspectively analyze the elements which constitute the sensation of tickling.

6. *The Temperature Sense.*

Experiment 16:—Place one hand in hot, and the other in cold water. Then transfer both to lukewarm water. What does this suggest as to the temperature zero?

7. *Touch.*

- (1) The Evolution of the Sense of Touch.
- (2) The Sense Organs Involved.
- (3) Touch, Contact or Pressure.
- (4) Is Touch the Ultimate Test of Reality?
- (5) The Empirical Ego.

Experiment 17:—Strike the toes a smart rap with a light stick. The pain will be perceived noticeably later than the first sensation of contact. What is the significance of this?

Experiment 18—Have another person close his eyes. Touch his forearm with a pencil point, and require him to touch the same point with another lead pencil immediately afterward. Note the difference and the direction of the error for different parts of the body.

Experiment 19:—Find the least distance apart at which the points of a pair of compasses can be recognized as two when applied to the skin of the forearm. Try the same with other parts of the body.

Experiment 20:—Perform Aristotle's Experiment, according to the directions given in Sanford's "Experimental Psychology," Part I, p. 2.

Experiment 21:—Take in the hand a number of coins all of the same size. How many can you simultaneously perceive by touch alone?

8. *The Kinaesthetic Sensations.*

- (1) The Factors of the Kinaesthetic Sense.
- (2) The Muscle Sensations.
- (3) Joint Sensations.
- (4) Tendon and Ligament Sensations.
- (5) The Importance of the Kinaesthetic Sensations.
- (6) The Fundamental Imagery of Meaning.
- (7) Laura Bridgman and Helen Kellar.

(8) Kinaesthetic Equivalents; cf. Baldwin, *The Story of the Mind*, p. 20.

Experiment 22 :—Extend the fingers of the hand as widely as possible. Hold them thus extended for a moment, and then close them, relaxing them very slowly. Where are the sensations of strain located? Lift a heavy weight in the hand, and locate the distribution of the sensations of strain.

Experiment 23 :—Stick a pin into the table through a long strip of paper. Sit before it with the eyes closed, and with a lead pencil in each hand mark off equal distances on each side of the pin. Have another person note the errors of repeated trials.

Experiment 24 :—Partly open the mouth and with the lips held apart attempt to get clear images of the words 'bubble,' 'toddle,' 'putty,' 'thumping.'

Experiment 25 :—Stand erect with your back to the wall. Choose a point on the opposite wall. Shut your eyes and then point to it as exactly as possible with a rod held in both hands.

Experiment 26 :—Estimate by lifting in the right hand the weight of the second volume of James' '*Principles of Psychology*.' Estimate the height above the ground of the highest point of Rockefeller Hall. Are you conscious of the sensations which enter into each estimate?

Experiment 27 :—Rest a pencil point gently on the forearm of another person whose eyes are shut, and move it slowly and evenly up or down the arm. Require him to indicate his earliest judgment of the direction.

9. *The Static Sense.*

10. *Problematic Senses.*

REFERENCES.

- James, *Psychology*; Briefer Course, Chap. II.
 Ladd, *Outlines of Descriptive Psychology*, Chap. IV.
 Dewey, *Psychology*, 27-50.
 Baldwin, *Handbook of Psychology*, I, Chap. VII.
 Murray, *Handbook of Psychology*, Bk. I, Chaps. I and II.
 Stout, *Manual of Psychology*, Bk. II, Chap. VI.
 Scripture, *Thinking, Feeling, Doing*, Chaps. I, VIII, and IX.

Ladd, *Psychology, Descriptive and Explanatory*, 332-347.
 Calkins, *Introduction to Psychology*, Chaps. V, VI and VIII.
 Höfding, *Outlines of Psychology*, V, A.

CHAPTER XIII. TASTE AND SMELL.

1. *The Psychogenetic Significance of Taste and Smell.*
2. *Relations to Other Senses.*
3. *The Physical Stimulus of Taste and Smell.*
4. *The Organs of Taste and Smell.*
5. *Modalities and Classification of Tastes and Odors.*
6. *Delicacy and Localizing Power.*
7. *Gustatory and Olfactory Images.*

Experiment 28:—With the nostrils held try to distinguish by taste alone between a slice of onion and a slice apple laid on the tongue.

Experiment 29:—With some sweet substance, such as a piece of flavored candy, see if, by placing it on different parts of the tongue, you can locate a point more sensitive than others to sweet substances. Try the same with salt.

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Scripture, *Thinking, Feeling, Doing*, Chap. X.
 Murray, *Handbook of Psychology*, 32-40, 123-134.
 Ladd, *Psychology, Descriptive and Explanatory*, 327-329.
 Calkins, *Introduction to Psychology*, Chap. IV.
 Ladd, *Elements of Physiological Psychology*, 308-311, 376-379.

CHAPTER XIV. HEARING.

1. *The Psychogenesis of Hearing.*
2. *The Relation of Hearing to the other Senses.*
3. *The Physical Stimulus.*
 - (1) Sound waves.
 - (2) The Physical Problem Involved.
4. *The Organ and its Action.*
 - (1) The Receiving Apparatus.

- (2) The Accomodatory Mechanism.
- (3) The Mechanism for Transmission.
- (4) The End Organs in the Internal Ear.
- (5) The Central Auditory Connections.
- (6) Entotic Sounds.
5. *The Analysis of Hearing.*
 - (1) The Quality and Intensity of Auditory Sensations.
 - (2) Pitch and Timbre.
 - (3) Clang and Tonal Fusion.
 - (4) The Octave.
 - (5) The Evolution of Music.
6. *Localization of Sound.*
7. *Auditory Illusions.*
8. *Experimental Investigation of Hearing.*

Experiment 30 :—Find out the greatest distance at which another person can hear the tick of a watch held at the level of the ear.

Experiment 31 :—With your fingers on your ears, have another person clap his hands. Half a second after the stroke remove the fingers from the ears. You will hear a second stroke. Why?

Experiment 32 :—Listen for and see if you can "hear out" the overtones of a note struck on the piano, or, better, with a tuning-fork.

REFERENCES.

- Stout, *Manual of Psychology*, Bk. II, Chap. V.
 Scripture, *Thinking, Feeling, Doing*, Chap. XI.
 Ladd, *Psychology, Descriptive and Explanatory*, 330-332.
 Calkins, *Introduction to Psychology*, Chap. III.
 Külpe, *Outlines of Psychology*, 102-112, 280-307.

CHAPTER XV. SIGHT.

1. *The Psychogenesis of the Sense of Sight.*
2. *Relation of Sight to the Other Senses.*
3. *The Physical Stimulus of Vision.*

- (1) Light Waves.
- (2) The Physical Problem to be Solved.
- 4. *The Organ and Its Action.*
 - (1) The Structure of the Eye.
 - (2) Accommodation and Convergence.
 - (3) Upright Vision.
 - (4) Ideoretinal Light.
- 5. *The Analysis of Vision.*
 - (1) Quality of Visual Sensations.
 - (2) Intensity of Visual Sensations.
 - (3) Color Vision.
- 6. *Visual After Images.*
- 7. *Anomalies of Vision.*
- 8. *Experimental Study of Vision.*

Experiment 33:—Shut the eyes and turn them toward the sun or toward a bright light. What do you see? How do you account for it?

Experiment 34:—Accommodation: Perform the experiment, following the directions in Sanford's "Experimental Psychology," Part I, pp. 90-91.

Experiment 35:—The Blind Spot: Perform the experiment given in Sanford, p. 102-103.

Experiment 36:—After Images: (a) Look steadily for one minute at a fixed point of the window and then at the white wall. What do you see? (b) Look steadily at a red or at a green light. Shut your eyes and hold them shut for a few moments. What do you see?

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- Stout, Manual of Psychology, Bk. II, Chap. IV.
- Scripture, Thinking, Feeling, Doing, Chaps. XII-XV.
- Ladd, Psychology, Descriptive and Explanatory, 348-371.
- Calkins, Introduction to Psychology, Chap. II.
- Kölpe, Outlines of Psychology, 112-140, 308-316.

CHAPTER XVI. THE PERCEPTION OF SPACE.

1. *How the Space World is Built up.*

According to one theory space is an external reality quite independent of consciousness, existing outside of consciousness whether we cognize it or not. This is the objective theory of space. According to another theory space is simply a category or mode of cognition, and hence purely subjective. This is the subjective theory.

A more organic view regards space as having been built up in connection with the evolution of the psychophysical organism, by its reactions against its environment. The space world would be a different world to a biped and a quadruped, to a form capable of locomotion and to a sessile form, to a bilaterally symmetrical and to an asymmetrical organism. Hence an adequate study of the genesis of space perception would enter into the questions of the first appearance of the bilaterally symmetrical organism and into the origin and nature of locomotion in animals.

2. *The Space Senses.*

There are two kinds of space, tactile-kinæsthetic space and visual space. Some psychologists question as to whether the latter is really different in character from the former, i. e., whether there is any extensity of sensation which has not its origin ultimately in tactile or kinæsthetic imagery. But other psychologists claim that there is visual perception of space independent of the use of the muscles of the eye. Obviously the perception of space, if the former view is the correct one, would be quite different for an animal which had lateral eyes, which could

only be focussed successively on an object, and for an animal, like man, who can focus both eyes simultaneously on a single object.

The tactile and kinæsthetic sensations become an important factor in the construction of the space world in all coordinations of opposing sets of muscles or organs for the performance of acts such as coordinations of the two hands, of the hand and foot, of the hand and mouth, of the hand and eye, of the foot and nose or ear, etc. The space world of the animal would naturally get its form from the character of the experiences which constituted the content of its struggle for life. Ambidextrality means a larger command over physical objects. The acrobat, the juggler, the sailor, the aeronaut, each has a space world to some extent peculiarly his own. If you take hold of a needle, a cane, a hatchet, a knife, a violin-bow, the throttle of a locomotive, you are thereby enlarging your control over the space world. The steam hammer, the sewing machine, the reaper, are but extensions of the hand. The locomotive, bicycle, ship, automobile, balloon, are extensions of the leg or wing. The microscope and telescope are a refinement of the eye; the telephone, phonograph, and wireless telegraphy, of the ear.

3. *Length, Breadth, and Depth (or Height).*
4. *The Perception of Movement and of Direction.*
5. *Space Illusions.*

REFERENCES.

- James, *Psychology* : Briefer Course, Chap. XXI.
Stout, *Manual of Psychology*, Bk. III, Division II, Chaps. IV & V.
Ladd, *Outlines of Descriptive Psychology*, Chap. XI V.

Calkins, Introduction to Psychology, Chap. VII.

Höfding, Outlines of Psychology, V, C.

Külpe, Outlines of Psychology, Part II, Section II, Chap. I.

Wundt, Outlines of Psychology, Section X.

CHAPTER XVII. THE PERCEPTION OF TIME.

1. *The Mutual Relations of Time and Space.*

The space and time worlds have been built up together. Succession and simultaneousness are to a certain extent correlative conceptions, since in order to apprehend in detail all the elements in a simultaneous presentation it is necessary to perceive them in succession. The language descriptive of time relations is often borrowed from space and the language of space is sometimes borrowed from time.

But there is this difference between time and space, that while the parts of space appear to be an aggregate, the parts of time form a series. Space has been called the present of time, and time the elsewhere of space. An interesting question is, Why has time only one dimension while space has three? While space may be represented by a solid sphere, time can be represented only as a line, i. e., as the projection of a point. Different times do not stand side by side, but follow one another.

2. *How the Time World has been Built Up.*

(1) Time and Rhythm. Time must have grown originally out of the attempt to measure distance in terms of rhythmical bodily movements, such as paces or leaps. For example, to say that a tree is so many paces away means that it would require the performance of so many successive acts to cover the distance between you and the

tree. The unit of time measurement must first have been some activity of the organism.

(2) Time and Memory. But in order that such a time series should be built up it would be necessary to remember the earlier part of the series of steps until the end should be reached. Thus memory is an essential condition for the construction of the time world. Titchener says that time begins with the distinction of a "not yet" consciousness and a "no more" consciousness (p. 390).

(3) Time as Ideal Construction. Time thus arises as a development of the past and future by an expansion of the present by means of memory and imagination. Past and Future are ideal constructions within the Now. They are the Now pulled out at both ends, so to speak. Or the Now may be regarded as produced by a telescoping of past and future Thens. The important point is, that activity is the real measure of time. Time passes, not so much by years, hours or minutes, as by heartbeats, meal-times and anticipated pleasures or pains.

3. *The Time Senses.*

Hearing has been called the time sense, but without question the tactile and kinæsthetic sensations play an important part also in the preception of rhythm, which lies at the foundation of all time perception. Accent and meter in music and poetry furnish an endless field for the study of time perception. Why do we lose all accurate account of time in dreams?

4. *Action Time.*

(1) Reflex action time

(2) Conscious action time.

(a) Simple Reaction time

(b) Discrimination time

(c) Choice time.

5. *Past, Present, Future.*

6. *Time Illusions.*

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Höfding, *Outlines of Psychology*, V, C.

Külpe, *Outlines of Psychology*, Part II, Section II, Chaps. II and

III.

Wundt, *Outlines of Psychology*, Section XI.

CHAPTER XVIII. LANGUAGE AND THOUGHT.

1. *The Origin of Language.*

There are several theories as to the origin of language:

(1) The onomatopoeic or bow-wow theory, that all human speech started in the coinage of imitative words such as buzz, whiz, splash, etc.

(2) The interjectional, exclamation, or pooh-pooh theory, which ascribes the origin of language to natural cries, to the "Ohs" and "Ahs" of primitive man.

(3) The pathognomic or ding-dong theory, that the roots which constitute the elements of language were the spontaneous productions of a power of language inherent in human nature—that specific kinds of objects so affected primitive man as to "ring out" of him corresponding specific utterances.

(4) The Music or tra-la theory, that language originated in primitive song.

(5) The synergistic, sympathetic or yo-heave-ho the-

ory, that language originated as the expression of common work, that language originated in a *clamor concomitans*: this is the theory of the communal origin of language.

The important elements of truth in these theories are found in the emphasis, first, on the practical, and, second, on the social origin of language. Names have a practical origin, e. g., cf. Hebrew and Indian names. Diacritical marks serve to differentiate the agent, the action, the object, etc. The basis of all language is activity. The Semitic languages regard thinking as an inner speaking. There is evidence that all written language originally sprung from rude picture writing. Language, says Jean Paul, is "ein Wörterbuch erblasster Metapheren"—a dictionary of faded metaphores.

Intellectual growth both in the race and in the child is dependent upon social intercommunication or expression of ideas. Language in the chief medium of such expression. Symbols as instruments of individual thought come later than symbols in their social character. Thinking is the dialogue between two persons translated over into the dialectic of two phases of consciousness. Language probably originated in the cries and calls of animals, the vowels first. As Professor Patrick says, the cry of pain, the scream of fear, the shout of joy, the growl of anger, the song of love, and finally the articulate word are all forms of language. The cry of pain brings food and aid to the young. The song of love is useful in alluring the desired mate. The scream of fear is a warning of danger. The growl or snarl or roar of anger is useful in putting to flight an opponent. The human analogues would be weeping, screaming, laughing,

swearing, singing, and talking. Cf. Patrick, *Psychological Review*, VIII, 123.

2. *Thought Without Words.*

(1) Is language or thought prior? It all depends upon what is meant by the question. Can we think without language? Max Müller says: "No reason without language; no language without reason." But if thought is not possible without language, how could language itself grow? If language is primarily some mode of motor reaction which comes to stand as the sign or symbol of some other reaction or group of reactions, then any motor expression may serve as a language symbol. Examples of such motor expressions are beckoning, threatening with the fist, scowling, raising the index finger, exclamations and imitative sounds generally. The spoken or written word is only one form of such motor expression. Words have proved the most effective sort of instruments for the expression of thought, but they represent simply a part of a great class of experiences which are used as symbolic. Pictures are language without words. Geometrical figures are residual pictures. The child gets and uses a meaning from objects and from pictures long before he can name these objects or read the description of the pictures in the text.

(2) Even among civilized human beings, with their complex languages, the inability of language to express thought is a commonplace. How difficult, often, it is to say just what you mean. An important part of literary criticism is the interpreting of what an author explicitly says in terms of what there is other evidence that he meant to say. The meaning of a sentence often lies rather

in the context, accent, gesture, intonation, and general attitude, than in the formal verbal statement. This all suggests that, in the large sense, thought is prior to what is ordinarily understood as language. But if by language we understand simply a special modification and a special use of one motor expression to stand for another, obviously thought is not prior to language, for both thought and language are special growths out of action.

(3) Though some of the lower animals have elaborate systems of signs, either felt or seen or heard or smelt, or possibly appealing to senses unknown to us, yet it is true on the whole that verbal language is distinctively human. Man is the speaking animal.

Professor Baldwin has suggested that righthandedness was used for expression before speech, and that speech has arisen from the setting aside, for further development, of the area in the brain first used for righthandedness.

3. *The Function of Language in Thought.*

Language serves to keep up the tension of thought by bringing past and future together. By means of oral tradition or written documents it is possible for the modern thinker to commune with the sages of antiquity. It is because language serves to keep an end before the mind and to define it, that it has been of so much service in the evolution of reflective thought.

Language facilitates abstraction. Names are universals. A word is a device for preserving the meaning or value of former experiences without again going through those experiences. Language becomes a vehicle of thought because words can be substituted for detailed

processes of reasoning. A word may thus be a condensed sentence or judgment ; a phrase may come to stand for many judgments.

Language serves to make thought exact, communicable and socially verifiable. Knowledge grows more exact by communication because in this way different knowledges are brought into comparison. The great value of written language lies in this fact, that thereby the views of different persons distant in time or space may be brought into interaction. Language began as simple oral communication from mouth to ear. Graphic communication from hand to eye came later. Today the means of communication through language are represented in a multiplicity of agencies, such as the printing press, the telegraph, the telephone, the phonograph, the graphophone, wireless telegraphy, etc.

4. *The Unit of Meaning.*

(1) The Word as a Symbol.

The spoken or the written word may be viewed as just so much sound or ink-marks. Or it may be viewed as expressing a certain meaning. Whether the sounds or the ink-marks have any meaning will depend upon the consciousness of the individual. A group of spoken or written letters may have a definite meaning for you which is entirely lost on the savage or the child. The significance of language symbols for thought lies in their content of meaning, not primarily in their form as so much sound produced by the vocal cords or so many ink-marks made with a pen. We react on what a person means, not necessarily on what he says. We regard that language as imperfect which falls short of or goes beyond the mean.

ing. Yet most words are imperfect in this sense. They either fail to express all the meaning or else express too much.

(2) The Factors of the Language Consciousness.

The inadequacy of language to express thought arises from the fact that while words are, so to speak, fixed and dead, thought itself is constantly alive and growing. Thought outstrips language. Only an analysis of the factors which enter into the use of language as a medium of the expression of thought will give us the key to the true function of language as such an instrument. A word is either heard or seen or spoken or written. This involves auditory, visual, or kinaesthetic (articulate or graphic) sensations or images. If, now, language is ultimately simply a special development of motor expression, then the kinaesthetic must be the fundamental imagery of meaning.

(3) The same consideration shows that the unit of meaning is the sentence rather than the single word, since the unit of expression in action would be a single act or coordination. No act could have a meaning unless or until it was carried out to the accomplishment of an end. So no combination of letters or words can have any meaning except as it symbolically reflects such an act. This view is supported by the fact that primitive peoples did not separate their words in writing. The alphabet did not originate until long after the origin of language. Our language and literature did not begin with separate words, expressive of separate ideas, which were then welded together into the phrase, the sentence, and the paragraph,

but it began as a vague whole which was then analyzed into these elements.

5. *Language and Judgment.*

If the foregoing view is correct, then the unit of thought is the judgment, just as the unit of meaning in language is the sentence. Neither the noun nor the verb is prior in the origin of language. They arose together, since both are essential to the expression of a unit of meaning. The verb is the most active part of speech, i. e., it expresses the dynamic character of the experience within which the distinctions of substantive, adjective, adverb, etc., are set up. A command, a wish, an exclamation, a question, may be viewed as judgment in the making. These are incipient judgments. They are judgments before they have become clearly analyzed into the phases which in the developed judgment we call subject, predicate and copula. When a unit act of thought comes clearly to be stated as a judgment in formal language elements, it is called a proposition. But here, of course, thought as such has ceased, for the proposition is a fixed inert language form. Mere terms and propositions are not thinking. Thought ever moves on, leaving these dead symbols behind it, as the butterfly leaves its dead chrysalis-shell as a mere reminder of what it once was.

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Ladd, Outlines of Descriptive Psychology, Chap. XIII.

Bawden, A Study of Lapses, 44f.

CHAPTER XIX. ASSOCIATIVE MEMORY.

I. *Memory in Animals and in Man.*

Experience embraces the memory of an historic past, the consciousness of a living present, and the ideal of the coming future. Through memory we reconstruct the past, and through imagination we construct the future, from the standpoint of the present. One reason for the human ascendancy is the capacity which man has developed, for the mediation of experience through memory and imagination. Mental progress from animal to man is not from little and simple to big and complicated, but from direct to indirect, i. e., from immediate to mediated type of experience. The consciousness of the lower animals is like that of a child in his play, who simply follows and acts upon the images of the passing moment. Consciousness is limited to the brief span of the present.

The animal consciousness and the consciousness of the child are predominantly affective and lacking in memory. This is why the period of infancy is a blank to us. This may also be the reason why the period during sleep, anaesthesia, faint, etc., is a blank. Feeling consciousness is not wholly absent, but that memory is lacking which is essential to organize it into the systematic whole of our experience when we are awake. Memory probably originated as a prolonged or continued after-image. Memory means simply a more prolonged and wider spread organic tension than does a mere momentary flash of feeling, and involves the establishment of complex and intricately interrelated neural connections in the cortex, e. g., in the Flechsig association areas.

The ability to learn by experience is made possible only by memory, for an animal cannot profit by past experiences unless it remembers them. Conscious memory at first is only spasmodic and discontinuous; animals rely more upon habit and instinct. Associative memory appears only when these relatively separate and unconnected memories become organized into a coherent whole in relation to the conscious needs of the organism. The evolution of the relatively unified and comparatively continuous human consciousness has resulted from the linking together in memory of what in lower animals are, from our point of view, discontinuous and unorganized fragments of consciousness.

Instinct and habit, in a sense, are memory, i. e., unconscious or so-called organic memory. They preserve the effects of past reactions of the organism in such a way as to modify later reactions. But memory, in the strict sense, is a conscious process. In this sense, we have not memory, but memories, built up each in connection with a certain sense or group of senses, and more or less loosely or closely interrelated according to the character and complexity of the experience of the individual.

2. *Memory and Imagination.*

Memory and imagination are correlative processes in consciousness which stand for the past and the future in experience. We do not attempt to recall past experience save with reference to some future end. We strive to remember some former act or event in order to know how to react to some present or future situation. That is, all memory implies imagination; all reproduction implies idealization. On the other hand, all idealization implies

reproduction or memory, since it is only in terms of past action that we can plan future action. It is true in one sense that experience is ever new. In another sense, it is true that there is nothing new under the sun, because every fresh advance, every new discovery or invention, proves after all to be but a natural outgrowth and development of some previously existing experience.

Memory and imagination represent the conscious functioning in experience, of habit and ideal, and are found only in the reflective stage. In instinctive experience there is no clear or persistent balancing of an habitual impulse over against a mediated (i. e., an ideal) impulse, but one act leads over into another act with little or no mediation. But in the rational or reflective consciousness, such as the human consciousness, the distinction is set up between means and ends. The ends are the ideal, the means are the habitual, aspect of experience. Memory is simply a name for that mechanism by which consciousness organizes its habits as means to action, and imagination, on the other hand, is the mechanism by which consciousness organizes its ideas or ideals as the ends or purposes of action.

3. *The Nature of Memory.*

Memory is not a faculty but a fact of consciousness. Our ideas are not stored away somewhere as in a cabinet. When they pass out of consciousness they cease to exist as ideas. Ideas can no more be stored up than shadows or the movements of a bird on the wing. Your memory of a landscape—what is it? There is not an image of the landscape already existing in some out of the way corner of the mind, which by memory you bring to light. What

is stored up is, not the image as such, but the capacity to produce such an image at will. What is retained is, not an idea, but a neural habit which, under the appropriate conditions, is capable of reproducing the idea.

The fundamental fact concerning memory is the fact of the *retention* of physiological traces in the nervous centres. Those parts of the brain concerned in the original process of perception are by some means brought again into essentially the same state of excitement. This gives rise to the image or idea. When these traces operate to stimulate the appropriate action without the process coming to consciousness, we call it habit; when the process of stimulation and response comes to consciousness, we call it memory. Memory represents the background of experience coming into the focus of consciousness. It puts that part of the experience at the disposal and under the control of the consciousness of the individual. The facts which are often recalled apparently so arbitrarily are always, so to speak, strung upon the invisible thread of some deep-seated habit, which, under the appropriate conditions, comes to consciousness in memory.

I meet a former acquaintance and cannot remember his name. After leaving him, I feel vexed at my lapse of memory and seek to recall the name. But other matters arise and crowd the incident out of consciousness. Sometime afterwards the name suddenly leaps into memory or, as Professor James says, it comes sauntering into consciousness just as if it had never been sent for. This apparently spontaneous revival can only be explained by unconscious cerebration. In the few moments of vexation and effort to recall the name I initiated a process of or-

ganic tension which, though prevented temporarily from yielding its product in consciousness, at once asserts itself when the inhibitory pressure of more peremptory matters is removed. There is no necessity and no justification for the assumption, made by some writers to explain such phenomena, of a sub-consciousness or a subliminal mental activity, in the sense of another kind of consciousness lying back of or below our ordinary consciousness.

4. *Analysis of Memory.*

In the memory of, say, your mother's face, there are three steps: There is, first, the *reproduction* of an image similar to former experiences—a visual image of a face, similar to a visual percept in the past. There is, second, the *recognition* of this image as an image of something familiar in your experience. In the third place, there is the possibility of more or less exact *localization* of this in your past experience.

Many vagrant images float loosely around in consciousness without attachment to any particular situation or point in past experience. These are not properly called memory images, but they are the material out of which definite memory images may develop. I try to recall a face or a name. Something vague and with a feeling of familiarity about it hovers in the background of consciousness, but not until I can definitely image it and locate it is it properly to be called memory. Memory images grow and develop like any organic process, according to certain laws and principles. They begin as vague schemata or fragments—the rag and tag ends of ideas—and by subtle processes of relative suggestion which are as yet but little understood, the part suggests the whole, or the part sug-

gests another part, and this the whole, and so on until a total experience is built up. Cf. *lapsus memoriae*.

5. *Laws of Associative Memory.*

The fundamental law of associative memory is that, other things being equal, that other experience is most likely to be recalled: (1) which has most frequently been repeated, (2) which has most recently occurred, (3) which has the greatest number of contextual relations, (4) which was most vivid and emotionally congruous at the time it occurred. The most important of these is the contextual relations. The great help which language is to memory comes from the fact that it so greatly multiplies the possible number of relations in which a remembered experience may stand.

Association by contiguity, association by similarity, associative supplementing, verbal association, association after disjunction, association by partial identity, simultaneous association, successive association, fusion and colligation, assimilation and complication, conflict and coalescence, mediate association, apperception, are simply names for associative memory in different aspects.

6. *Ideational Types.*

Some people are eye-minded, i. e., *visuels*. Others are ear-minded, i. e., *audiles*. Others still are *moteurs*, i. e., they think, predominantly, in terms, of kinaesthetic imagery. The dog and the deer are smell-minded. The bat and the mole are touch-minded. Some persons remember best the things that they *do*; others remember best the things they *see*, *hear*, etc. When one type of imagery become habitually used in connection with or partly as a substitute for another kind of imagery, we get

the phenomena of synaesthesia, chromaesthesia, number-forms, etc. Read Titchener, *Manual of Experimental Psychology*, Students' Edition, Vol. I, Chap. XII.

7. *Experiments on Memory and Association.*

Experiment 37:—What is the first thing you thought of and did on waking this morning? What was the chief topic of conversation at dinner yesterday? When did it rain last? Was it cloudy or clear last Sunday? Which end of your collar do you button on first? Which shoe do you put on first? Are a cow's ears above, below, behind, or in front of her horns? Do cats ever climb trees? If so, do they descend head or tail first? Does a horse rise, with its fore or its hind feet first? How about a cow?

Experiment 38:—Attempt to visualize the face of your roommate, a bouquet of pink carnations, four little kittens in a basket, an oak leaf, the inscription on a five dollar gold piece, a grey and a pink ribbon lying side by side.

Experiment 39:—Attempt to image clearly the chimes of some church bells with which you are familiar, the chirp of a cricket, a mower whetting his scythe, the dripping of water from the eaves, the Swan Song from Lohengrin, "America," the crack of a whip.

Experiment 40:—Attempt to image the feel of your hair, the feel of silk, the feel of the handle of a tennis racket, the feel of a peach, the feel of a hat on your head, the prick of a pin.

Experiment 41:—Attempt to image the feel of ice, of hot air coming up through a register, of ice-cream in the mouth, of a hot iron brought near the face.

Experiment 42:—Attempt to image the smell of sweet violets, of boiling cabbage, of camphor, of a geranium leaf, of new-mown hay, of freshly baked bread.

Experiment 43:—Attempt to image the taste of an orange, of salt, of lemon, of wintergreen, of candied cherries, of chocolate.

Experiment 44:—Attempt to image the feeling of effort in skating, in riding a bicycle up hill, in swinging, in two-step, in opening the closed hand: in jumping, in climbing the stairs.

Experiment 45:—Write one hundred words as rapidly as possible strictly in the order in which they occur to you.

REFERENCES.

- James, Psychology; Briefer Course, Chaps. XVI and XVIII.
Stout, Manual of Psychology, Bk. IV, Chap. III.
Dewey, Psychology, Chap. VI.
Ladd, Outlines of Descriptive Psychology, Chap. X.
Scripture, Thinking, Feeling, Doing, Chap. XVIII.
Calkins, Introduction to Psychology, Chaps. XIII, XV, and XVI.
Titchener, An Outline of Psychology, Chap. XI.

CHAPTER XX. IDEALIZATION OR CONSTRUCTIVE IMAGINATION.

I. *What is Idealization?*

Imagination in the original and literal sense of the word is image-ination, and would thus include both memory or reproductive imagination and idealization or constructive imagination. But the term has come to be used almost exclusively in the latter sense, which is the use here. In one sense, memory may be regarded as an idealization, a reconstruction of past, in terms of present experience. But ordinarily it is the reproductive aspect of memory, as it is the idealizing aspect of imagination, which is most prominent.

Imagination in this sense, as distinguished from memory, is anticipative and prospective. It is prophetic of the future, as memory is retrospective and a reminder of the past. Imagination is a special exercise of the attention: it is selective and adaptive. It is the ambitious, the athletic faculty of the mind. It is the imagination which the inventor employs in making his discoveries. The imagination is the source of the working hypotheses of the scientist. Imagination is the heart of religious belief

or faith. Imagination is the instrument of the artist and poet. Imagination is the essence of all preperception and apperception, of all scientific investigation and philosophic reflection.

What is in the actual focus of consciousness is often a very small content indeed, but through the process of idealization it is possible to project ourselves backward or forward in time or upward or downward or outward in space, and thus greatly widen the scope of conscious experience.

2. *The Element of Novelty in Experience.*

Idealization is related to attention as memory is related to habit: it is the reflective use of attention for the elaboration of the details of an intricate adaptation in experience. An ideal is to thought what the growing-point is to a plant: it is the place where the new is being evolved in experience. Here thought overleaps all past associations, breaks the bounds of all past experience, and makes new combinations, gains a new outlook. An ideal is a new view of experience which makes all previous and existent experience appear as a mere torso, or fragment, a part only, of a possible larger whole. The process of idealization is the attempt to grasp this larger whole.

But an absolutely new idea, a mere ideal, would be a contradiction in terms. An idea or ideal is simply past or present experience viewed in a new light, viewed not simply for what it is, but for what it may become. An ideal is simply a problematic or possible, as contrasted with an already existent and actual experience. It is the attractive or drawing power of our ideals, taken together with the

propulsive or goading power of our impulses, which keeps up any progress in the growth of our experience.

3. *The Conditions of Inventiveness.*

The highest expression of constructive imagination or idealization is found in its use in the discovery of new truth, in the origination of new ideas. We call that man a genius in whom the conditions of inventiveness are realized. His originality is comparable, in the social world, to those fortuitous variations in the biological world which lead to the progressive evolution of organic life. They are called fortuitous simply because the law according to which they appear is not yet understood. By some as yet little understood principle, the genius organizes old elements into such new combinations, or brings to light new factors in such a manner as to lead to entirely new ways of doing things. The formative period in the youth of every child is an inventive period in a sense, and the highest type of education is that which aims to develop the original impulses which display themselves at this critical period. The only general statement which can be made as to how to secure and maintain these conditions is that the greater freedom the natural impulses of the child can have, while yet being kept under the control of a rational principle, the greater chance there is for the development of originality and inventiveness.

4. *All Knowledge is Idealization.*

Idealization represents the transition from the concreteness of sense-perception to the abstractness of thought. Idealization is conception as process. It is the search for an ideal or universal which will explain or interpret the concrete data supplied by observation through

the senses or by memory: Hence idealization, on the one hand, is abstract. An abstract idea is a tautologous expression, since all ideas are abstract: it is the very nature of an idea to be abstract. Yet, on the other hand, idealization is essentially teleological or purposive. It is directed toward a concrete end: the ideal is an end. All idealization is selection with reference to an end. The whole aim and significance of an ideal is that it seeks its own concrete realization.

This is the solution of the apparent paradox of the ideal and the practical, the paradox of theory and practice. The value of the ideal lies just in the fact that it gets far enough away from our practical life of action to see and understand the method of that action. The commander of an army leaves the battle-field and goes up on a mountain, but it is the better to control through his emissaries the plan of action on that battle-field. All thinking is simply the bringing to consciousness of the technique of our acts, and generalizing it as a law or principle so that it can be utilized on future occasions. Every scientific or philosophical law is ideal in this sense. But this sort of idealization does not mean that the ideal is mere theory in the sense of being opposed to practice: it is developed just for the sake of action; it is the theory of practice.

5. *The External World as Ideal Construction.* Stout, Manual of Psychology, Bk. IV, Chap. VI.

6. *The Self as Ideal Construction.* Stout Manual of Psychology, Bk. IV, Chap. VII.

REFERENCES.

James, Psychology; Briefer Course, Chap. XIX.

Stout, *Manual of Psychol.* Bk. IV, Chaps. II, IV, VI, VII, VIII,
 Dewey, *Psychology*, Chap. VII.
 Ladd, *Outlines of Descriptive Psychology*, Chap. XI.
 Murray, *Handbook of Psychology*, Bk. II, Chap. IV.
 Titchener, *An Outline of Psychology*, Chap. XI.
 Calkins, *Introduction to Psychology*, Chap. XV.
 Baldwin, *Story of the Mind*, Chap. X.

CHAPTER XXI. JUDGMENT AND INFERENCE.

1. *Judgment is the Unit Act of Thought.*

Creighton says that consciousness must be regarded as having from the first the form of a judgment. This is true if by judgment is meant any projection of means and ends, however vague. In this sense all consciousness and attention involve judgment. Judgment is the unit act of reflective thinking. There is no thought process which does not involve some reference of meaning to fact, some interrelation of means and ends, some tension and interaction of sensation and idea, some analysis or synthesis of a subject matter in and through a predicate.

2. *Experience as a Series of Judgments.*

Experience may be viewed as one continuous judgment or as a series of related judgments. Bosanquet speaks of judgment as the consciousness of a world, and describes knowledge as the continuous affirmative judgment of the waking consciousness. We may conceive that consciousness represents the widest possible judgment, which asserts the universe as a great systematic whole, and that this is broken up into myriad specific judgments which state in detail what is implied in such an all-comprehensive judgment. If experience be conceived as the successive solution of life problems, and each judgment be taken as representing the solution of a single problem, then the

whole history of science may be viewed as one great, prolonged, complex, detailed effort to solve the riddle of the universe.

3. *Judgment is the Consciousness of the Process of Mediation of Experience.*

A judgment is an organic growth. Judgments are not shot out of a pistol. The whole process of judgment grows out of the needs of an active experience and has an intermediary function in such an experience. Judgment is a process rather than a product. The essence of judgment is inquiry as to the value of some experience. If an experience is unsatisfactory for any reason judgment comes in to make it adequate. Judgment is the searching out of the ways and means of action. It is an experience in the act of consciously passing over into another experience with a recognition of the grounds or reasons for the transition. In judgment the rational consciousness reaches its highest point of development. This is not the highest stage of experience, since judgment may become automatic or intuitive, but this is the highest form of that process of conscious mediation or reconstruction by which the growth of experience takes place.

4. *Subject, Predicate, and Copula.*

The significance of the subject, predicate, and copula, in the judgment, lies in the respective functions which they perform in the mediation of an experience. The subject is the formulation of the conditions of action. The predicate is the statement of the method of dealing with the conditions. The copula is the attempt to apply the method under the conditions.

Take an illustration from practical life. You wish to

become a proficient singer and piano-player. This desire or impulse to sing and play represents an activity already going on, but in an imperfect and unsatisfactory way. Certain natural gifts, such as good vocal organs, a good ear, pliable fingers, and a certain knowledge of the technique of vocalization and of instrumentation,—these represent the available material or subject-matter which may serve as a basis for making a good singer and player. This is the side of the subject of the judgment, the means which may be employed, the conditions of action.

On the other hand, this desire to become a skillful singer and player involves a conception, an idea, and an ideal which you hold before you and strive to realize. As your knowledge of the subject enlarges, your ideal grows and you gain some notion of how to go about the process of becoming an accomplished musician. Your vague ideal takes on the form of a definite plan or method of training which will prepare you for the achievement of your desire. This is the side of the predicate of the judgment.

Then there is the actual process of learning, of studying and practicing, of striving to actualize this ideal and apply this method. This is the copula of the judgment, the actual process of bringing means and ends together and realizing the end in and through the means. The copula expresses the movement in the judgment toward the realization of a new experience in and through the subject and predicate.

5. *Conception, Judgment, Reasoning.*

Conception, judgment and reasoning are not stages but phases of the one process of thinking. Conception

simply represents an important step in the process of judging, and reasoning or inference is simply the elaboration of the implications of a judgment. Conception is often treated under five heads, as though these were stages in the process of producing a concept. But this is an error. Observation, abstraction, generalization, comparison, classification, are not successive steps in the process of thought. They are simply important phases which under certain circumstances stand out as prominent. Every act of thought involves all of these from start to finish. All observation is selection according to a principle, and thus involves classification. All abstraction implies both generalization and comparison. All generalization implies abstraction and comparison. All comparison implies observed facts to be compared and principles of classification. And classification can take place only on the basis of all these other processes.

Experiment 46:—Describe all you can see on a two-cent postage stamp. Which way does a bicycle-rider turn the handle bars when the bicycle turns to the right?

6. *An Inference is an Expanded Judgment.*

An inference differs from a judgment only in complexity. An inference is a critical judgment, a judgment the grounds of which are as far as possible made explicit. The major and minor premises in the syllogism, bear the same relation to the process of inference or reasoning that the predicate and subject bear to judgment. And the middle term in the syllogism corresponds to the copula in the proposition. Just as in judging, the subject and predicate are constituted in and for the sake of the mediation of an experience, so in inference the premises do not

exist ready-made before the inference begins, but inference *is* the process by and in which they are constituted. What we call propositions and syllogisms are not judgment and inference; they are the dead shells, the empty language forms, which once contained but which now serve only to remind us of the living thought.

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- Creighton, Introductory Logic, Chaps. XX and XXIV.
 James, Psychology; Briefer Course, Chap. XXII.
 Ladd, Outlines of Descriptive Psychology, Chap. XII.
 Wundt, Human and Animal Psychology, 353—366.
 Stout, Analytic Psychology, I, Chap. V.
 Calkins, Introduction to Psychology, Chap. XVIII.

CHAPTER XXII. ABNORMAL STATES.

1. *What is Normal Experience?*
2. *Sleep and Dreams.*
3. *Illusions and Hallucinations.*
4. *Automatism.*
5. *Suggestibility and Hypnotism.*
6. *Double or Alternating Personality.*
7. *Insanity and Degeneracy.*
8. *Aphasia.*
9. *Amnesia.*
10. *Aboulia.*

LITERATURE.

- Wundt, Outlines of Psychology, 267—275.
 James, Psychology, II, Chap. XXVII.
 Calkins, Introduction to Psychology, Chap. XXVII.
 Baldwin, Story of the Mind, Chap. VII.

CHAPTER XXIII. WHAT IS MEANT BY THE SELF?

Self consciousness is not a later or higher development of consciousness but, in at least a rudimentary form, is characteristic of all consciousness. It is simply consciousness with the emphasis on the agent rather than on the situation. There is a notself-consciousness or object-consciousness just as truly as a self-consciousness or subject-consciousness. Self and object, or agent and situation, are correlative aspects of experience.

In a wider sense, which identifies it with the totality of experience, the self embraces both self-consciousness and consciousness of the object. The self, in this sense, sums up the unity and continuity of the process of experience. It is not a fixed entity. It is a dynamic, growing reality, a constructive synthesis, a cumulative growth. Myself is different, is something more, today than it was yesterday. The synthesis of self consciousness is never complete.

The self is more than a mere succession of states of consciousness. More important than the stream of conscious states is that background of instinct and habit which constitutes an infinite subliminal self of which conscious experience is but the efflorescence and fruition. The real identity and permanence of selfhood lies not in any derivative conjunction or connection of ideas in consciousness, but in that unity and continuity of action which finds expression in instinct and habit.

Experiment 47 :—When you first awake in the morning, attempt to recall (1) the details of the dreamlife of your sleep, (2) the last *feeling* or idea before falling asleep, (3) the order in which the senses yielded to or awoke from sleep. What is the bearing of this on the consciousness of self?

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- James, Psychology ; Briefer Course, Chap. XII.
Ladd, Outlines of Descriptive Psychology, Chap. XV.
Stout, Manual of Psychology, Bk. IV, Chap. VII.
Calkins, Introduction to Psychology, Chap. XII.
Titchener, An Outline of Psychology, Chap. XII.
Baldwin, Story of the Mind, Chap. IX.

CHAPTER XXIV. BODY AND MIND.

An adequate statement of the relation between mind and body or the psychical and the physical would require a complete philosophy. But we may state here in outline the different answers that have been given to the question.

There are two general types of explanation, the ontological and the teleological. The ontological are either causality theories or theories of parallelism. According to the causality theories, mind and matter are either causally interactive, now the one, and now the other, being cause or effect (interactionism), or matter is the cause of mind (materialism), or mind is the cause of matter (spiritualistic idealism). According to theories of parallelism, mind and matter are either two independent orders of existence which stand side by side, parallel and concomitant without being causally related (Pre-established Harmony), or they are parallel and concomitant manifestations of one underlying reality which is unknown and unknowable (Agnosticism), or they are correlative abstractions from the one concrete knowable reality of experience. The last mentioned theory may be called teleological parallelism, and is to be distinguished from all the preceding, which, whether causal or parallelistic, are all ontological theories.

All experience, just because it is a living reality, is capable of growth or transformation. It is not an eternally fixed entity, but a changing expanding life with a developmental history. This experience is psychical when and where it is growing, just as a plant is green and tender at its growing-points, at its rootlets which push their way into the soil in search of moisture and nourishment, and at its buds which ever seek the light and air. That is, experience is psychical where it is undergoing reconstruction. Experience is not psychical all the time and everywhere, but only at critical points, at the points of transition and adaptation in the process of growth.

The distinction of the psychical and the physical is thus purely instrumental or methodological. Experience is one reality and is organic throughout, and this duality is a teleological, not an ontological one. And this, of course, is as far from subjective idealism as it is from the opposite error of materialism. In this point of view we return in a sense, though in a new sense, to the primitive and common sense view, not of a material body *and* an immaterial soul, but rather of an acting, feeling, thinking organism.

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- James, *Psychology: Briefer Course*, Prologue.
- Ladd, *Outlines of Descriptive Psychology*, Chap. XIX.
- Stout, *Manual of Psychology*, Introduction, Chap. III.
- Höffding, *Outlines of Psychology*, Chap. II.
- Titchener, *An Outline of Psychology*, Chap. XV.

CHAPTER XXV. PSYCHOLOGY AND PHILOSOPHY.

1. *Psychology as an Introduction to Philosophy.*

In the preceding two chapters, on the nature of the self and on the relation between mind and body, we have been discussing questions on the border-line between psychology and philosophy. Psychology as a science does not concern itself with the ultimate questions of being and knowing, but treats simply of the facts of consciousness in the process of experience. Whether there is any more fundamental reality lying back of these phenomena which appear and, if so, what is the nature of that reality, and how we can know it, are questions which, for convenience, are treated separately under the head of philosophy or metaphysics. But the fact that they are treated thus separately must not lead us to forget that the problems really grow out of psychology and in large measure must come back to psychology for their solution. The problems as to the ultimate nature of the universe, the relation of knowledge to reality, the objectivity of space and time, the nature and the use of the doctrine of causation, the theory of the absolute, the place of religion in life—these are problems which cannot be solved, which cannot even be stated, apart from considerations as to the nature of the conscious human being.

2. *Psychology and Logic.*

Logic may be regarded as the special psychology of thought. Thought processes have been worked out in elaborate form in connection with the logic of argumentation, in connection with the logic of mathematics, and in connection with the logic of the special sciences. The syllogistic logic of Aristotle is the logic of rhetoric. The

equational logic of Boole and Jevons is the logic of mathematics. The so-called inductive logic of John Stuart Mill is the logic of the physical or exact sciences. Modern instrumental logic aims to show how all scientific and philosophical method arises out of and is developed for the sake of action, and from this standpoint seeks to analyze and organize into one general methodology the special methods of the various sciences.

3. *Psychology and Ethics.*

Psychology is related to ethics somewhat as it is related to logic. If logic is the special psychology of thought, ethics is the special psychology of action. And just as logic has to go back to the psychology of action in order to interpret the full significance of thought, so ethics has to go back to the psychology of feeling and thought in order to interpret the full significance of action. Ethics analyzes not only overt conduct but also the springs and motives of conduct. It traces the sources of the ethical ideal, its relation to animal impulse, its mediation in the moral consciousness, the meaning and nature of virtue, the stages and the manner of the realization of the moral ideal in the moral life, the origin and the nature of the ethical standard as expressed in moral law, and finally the embodiment of moral ideas and conduct in social institutions. Throughout the whole of ethics there is an implicit use of psychological principles which shows the intimate relation between the two sciences.

4. *Psychology and Education.*

The relation of psychology to education is the relation of theory to practice. Before it is possible adequately to state the end or aim of education it is necessary to know

something about the educable individual. Before it is possible to devise a sound curriculum it is necessary to know the capacities of the child, the abilities of the teacher, and the evolution of that language, literature, art and science which is to form the subject-matter of the curriculum. In order to know how to teach most effectively it is requisite to know, not only instinctively but also reflectively, both the logical relations of the different parts of the subject-matter taught and the best methods of presentation of that subject-matter. All this requires a knowledge of the psychology of the child-mind, a knowledge of the psychology of the processes both of the reception and of the expression of truth, a knowledge of the growth of that reflective thought by which the great languages and literatures, arts and sciences, of the world have been evolved, and finally a knowledge of the psychology of the method which the teacher is to employ in the instruction of the pupil.

Thus psychology is a natural introduction to the study of the special problems of metaphysics, logic, ethics and pedagogy.

LITERATURE.

- Bowne, Introduction to Psychological Theory.
 Ladd, Philosophy of Mind.
 Baldwin, Story of the Mind, Chap. VIII.
 Baldwin, Dictionary of Philosophy and Psychology.

ERRATA.

- On page 10, sixth line, insert "central" before the word "nervous."
 On page 10, eighth line, insert "and response" after the word "stimulation."
 On page 11, line 17, insert "go" before the word "on."
 On page 25, line 7, substitute "mediate" for "meditate."

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